

# BIOLOGICAL ABSTRACTS

Volume 21, No. 1

JANUARY, 1947

Entries 1-306

## SECTION A — GENERAL BIOLOGY

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Philadelphia 4, Pa.

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## SECTION A

## GENERAL BIOLOGY

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# BIOLOGICAL ABSTRACTS

Editor-in-Chief, JOHN E. FLYNN; Associate Editor, JEAN MACCREIGHT

VOLUME 21

JANUARY, 1947  
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NUMBER 1

## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*

(See also Entries 192, 1615)

### PHILOSOPHY OF BIOLOGY

1. Pijoan, M., and F. Trowbridge Vom Baur. Science as the common ground for relations between nations. *Sci. Month.* 63(2): 137-140. 1946.—The authors note the successful result of placing the settlement of the oil expropriation difficulty between the U. S. and Mexico in the hands of 2 engineers representing the respective nations. The Institute of Inter-American Affairs and the Inter-American Educational Foundation are 2 U. S. government corporations which cooperate, through scientists, with scientists of other nations, with much prospect of increased harmony between nations.—*H. F. Copeland.*

### EXPLORATIONS, EXPEDITIONS, ETC.

2. Comstock, John A. Contributions from the Los Angeles Museum. Channel Islands Biological Survey. 33. Brief notes on the expeditions conducted between March 16, 1940 and December 14, 1941. *Bull. So. California Acad. Sci.* 45(2): 94-107. 1946.—Records in chronological order the 7 expeditions to the coastal islands of southern Calif., including Santa Barbara, San Nicolas, Anacapa, Santa Catalina, San Clemente, Santa Cruz and Santa Rosa Islands. Lists the personnel on each operation and a brief outline of the work accomplished. Reports new records of occurrence of certain birds on Anacapa I., and the presence of sea elephants at San Nicolas I. Gives brief notes concerning a few of the plants, snails, insects, mammals, birds, reptiles and Indian artifacts collected.—*J. A. Comstock.*

### INSTITUTIONS, ADMINISTRATION

3. Babicka, J. Ustavy přírodovědecké fakulty university Karlovy za německé okupace. [The departments of the Faculty of Science of Charles University during the German occupation.] *Biol. Listy [Prague]* 27(1/2): 7-10. 1946.—The history of the buildings, inventory and teaching material of the Faculty of Science of the Czechoslovak Univ. of Prague during the German occupation.—*Oscar Felsenfeld.*

4. Fish, Charles J. Japanese oceanographic and marine stations. *Trans. Amer. Geophys. Union* 27(4): 507-516. 1946.—"On a recent mission to Japan for the U. S. Navy the author was afforded an opportunity to interview representatives of the oceanographic and marine biological laboratories of the home islands, Korea, and Formosa." The present paper contains the summary of his inquiries. Generally we learn that "with the exception of the Palao Tropical Biological Station which was completely destroyed by aircraft bombing in 1944, all prewar Japanese Oceanographic Institutions . . . are either in operation or are planning to resume operation in the near future." An intimate geographical survey of the stations, etc., is given; remarks about organization, branches of the stations, scope of activities, equipment, publications etc. are added. The number of these institutions in Japan is so great that the really interested reader must be referred to the original paper which provides abundant data.—*V. Conrad.*

5. Mělka, J. Osudy ústavu biologických oborů na Ma-

sarykově universitě v Brně za válečných let 1939-1945. [The fate of the biological departments of the Masaryk Univ. of Brno during the war years 1939-1945.] *Biol. Listy [Prague]* 27(1/2): 5-7. 1946.—This is a historical survey of the fate of the buildings and inventories of the biological institutes during the German occupation of Czechoslovakia.—*Oscar Felsenfeld.*

6. Rigg, Theodore. The contributions of the Cawthron Institute to science and New Zealand agriculture. With bibliography of scientific papers and reports. Silver Jubilee Commemoration Lecture, October 29th, 1945. 57p., 1 map, 12 pl. Cawthron Inst.: Nelson, N. Z., 1945.

### MISCELLANEOUS

7. Blackford, John L. Desert dwellers. *Nat. Hist. [New York]* 53(1): 24-27. 9 fig. 1944.—Photographic studies of cactus wren, desert diamond rattlesnake, kit fox, Palmer thrasher, western mourning dove, giant saguaro cactus, desert scaly lizard, and young Abert towhee, with descriptive captions explaining their adaptation to desert conditions, and a picture of the Sonoran Desert in Ariz.

8. Compton, Karl T. (*Massachusetts Inst. Tech., Cambridge.*) Science and national policy. *Sci. Month.* 63(2): 125-128. 1946.—The author urges, for the benefit of national safety by promotion of basic research at all times and not only during emergencies, that Congress establish the National Science Foundation and the Atomic Energy Commission, finance them generously, place them in competent hands, and give them wide discretion.—*H. F. Copeland.*

9. Cusset, Francis. English-French-French-English technical dictionary. 590p. Chemical Publ. Co., Inc.: New York 1946.—A glossary, attempting to give, without definition, a single equivalent in French for each of the English technical terms included, and vice versa. The terms thus defined are mainly those employed in engineering, chemistry and physics, with a few geological and biological terms included.

10. Koningsberger, V. J. Van Scylla in Charybdis. Jaarrede van den voorzitter der Ned. Botanische Vereeniging. [Presidential Address.] *Nederland. Kruidk. Arch.* 51: 275-283. 1941.—A discussion of the prospects of botanical science and of the students in botany in the Netherlands.—*C. E. B. Bremekamp.*

11. Langmuir, Irving. Science and incentives in Russia. *Sci. Month.* 63(2): 85-92. 1946.—The author was in Russia in June, 1946, by invitation to the 220th anniversary of the Academy of Sciences of the U. S. S. R. The trip was made difficult by American governmental regulations. Standard of living in Russia is controlled by differential rationing rather than by money, and good work in science is well rewarded. The Academy has 142 regular members and 200 corresponding members, and conducts 78 institutes employing 15,000 people; the 790 universities are not directly connected with it. Progress in science has been good, and exceedingly extensive further work is planned. There was no restriction on personal contact; no damping of individual initiative or of "pure"



35. Reis, Erich. (U. Münster, Germany.) Zellbiologie als Aufgabe. [Cellbiology as a problem.] *Arch. expl. Zellforsch. bes. Gewebekult. (Explanation)* 25: 1-22. 1943.—A discussion in defense of "Cellbiology"—the study of cells from an "ecological standpoint", rather than as a unit of structure.—D. C. Hetherington.

36. Serra, J. A., et A. Queiroz Lopes. (U. Coimbra, Portugal.) Une méthode pour la démonstration histochemique du phosphore des acides nucléiques. *Portugaliae Acta Biol. Ser. A* 1(2): 111-122. 1945.—The method combines a phosphorus test with digestion by nucleases. Small pieces or sections of plant and animal tissues are tested following fixation in a mixture of alcohol, formalin, and acetic acid. The test comprises hydrolysis and precipitation of organic P compounds in a mixture of HCl and ammonium molybdate for 2-3 weeks, development of a blue color with an acetic benzidine reagent, followed by nuclease digestion to differentiate between nucleic acids and other P compounds.—B. P. Kaufmann.

### PLANT

37. Bergman, B. A contribution to the knowledge of the embryo-sac mother cell and its development in two apomicts. *Svensk Bot. Tidskr.* 38: 249-259. 1944.—In one individual of *Erigeron* cf. *annuus*, 4 types of division of the e. mc. were established: one pseudohomotypic, one mitotic, one meiotic and one with sticky chromosomes. The chromosome number was  $2n = 27$ . In *Chondrilla juncea* only a pseudohomotypic division was found. The chromosome number was  $2n = 15$ .—Artur Håkansson.

38. Cornman, Ivor. Alteration of mitosis by coumarin and parasorbic acid. *Amer. Jour. Bot.* 33(3): 217. 1946.—An abstract.

39. Coutinho, L. A. Racas cariológicas na *V. sativa* L. [Caryological races of *Vicia sativa*.] *Agronomia Lusitana* 2(4): 379-403. 1 pl., 15 fig. 1940.—In *V. macrocarpa*, in 5 races of *V. sativa*, and in *V. amphicarpa* the diploid chromosome number is found to be 12, although Sveschnikova has reported 10 for the last species. Ideograms are presented for these 7 forms, and for several hybrids of *V. sativa* × *V. macrocarpa*. The 3 spp. are regarded as distinct, but they have 3 "stable" or similar chromosomes in common. Some of the hybrids have aneuploid numbers or non-homologous chromosome pairs, and some plants with 10 chromosomes showed perfect pairing of 4 pairs of similar chromosomes and of one pair of non-homologues.—J. L. Carlledge.

40. Covas, Guillermo, y Carlos Cherubini. Número de cromosomas de cuatro especies de Gomphrena (Amarantáceas) de la Flora argentina. [Chromosome number of 4 Gomphrena spp. of the Argentine flora.] *Rev. Argentina Agron.* 13: 55-56. 1946.—In *G. perennis* and *G. pulchella*,  $n = 9$ ; in *G. martiana*,  $n = 10$ ; and in *G. tomentosa*,  $n = 15$ .—S. W. Edgecombe.

41. Cutter, Victor M. Jr. (U. Minnesota, Minneapolis.) Observations on the chromosomal morphology of *Neurospora tetrasperma* with the aceto-carmin smear technique. *Amer. Jour. Bot.* 33(3): 217. 1946.—An abstract.

42. Dangeard, P. Sur les différences de taille entre chromosomes appartenant à différents tissus dans la plantule de pin maritime. [Size differences in the chromosomes from different tissues of the plumule of the maritime pine.] *Compt. Rend. Soc. Biol.* 135: 581-583. 4 fig. 1941.—Chromosomes of the epidermal cells are narrower and longer than those found in the other histogens. These differences seem to be constant.—R. E. Cleland.

43. Delay, C. Structure nucléaire de *Datura stramonium*. [Nuclear structure of *D. stramonium*.] *Compt. Rend. Acad. Sci.* 222: 1407-1408. 1946.—Nuclei of *D. stramonium*, fixed in Navachin fluid and stained with gentian violet, show reticulated chromocenters (chromonemata) during interkinesis.—J. Dufrenoy.

44. Dixon, Henry H. Evidence for a mitotic hormone: Observations on the mitoses of the embryo-sac of *Fritillaria imperialis*. *Sci. Proc. Roy. Dublin Soc.* 24(13): 119-124. 21 fig. 1946.—Preps. of the embryo-sac of *F. imperialis* showed successive stages of mitosis following one another in faultless sequence, the nuclei of each stage forming parallel bands, containing 1, 2, 3 or more parallel lines of nuclei in the same stage. Such a distribution of mitotic stages suggests that the initiating cause of mitosis travels from the position

of the final stage represented to that of the earliest one in the sequence. This initiating cause is thought to be a diffusing vacuolar substance or hormone rather than any mitogenetic rays. The speed of diffusion suggests that the hormone must be in a crystalloidal state.—P. H. Yancey.

45. Fardy, A. (Lab. Bot., Fac. Sci., Bordeaux, France.) L'évolution des noyaux somatiques de *Nicotiana tabacum* L. et *N. sylvestris* Speg et Comes, et les rapports entre nucléole et chromosomes à satellites. [The evolution of somatic nuclei of *N. tabacum* and *N. sylvestris*, and the relationship between nucleolus and satellite chromosomes.] *Compt. Rend. Soc. Biol.* 135: 587-589. 1941.—The relationship of satellite chromosome to nucleolus is followed throughout the mitotic cycle. The SAT-chromosome plays a preponderant rôle in nucleolar organization, as previously postulated.—R. E. Cleland.

46. Gavaudan, P., et N. Gavaudan. Sur l'activité mitoinhibitrice de quelques esters de l'acide benzoïque et des acides ortho et para-aminobenzoïque. *Compt. Rend. Tran. Fac. Sci. Marseille* 1(5): 68-70. 1941.—Anomalies of mitosis in *Triticum vulgare* roots were produced by the vapors of methyl or ethyl benzoate acting for one hour, by  $\frac{1}{3}$  to  $\frac{1}{6}$  sat. methyl anthranilate, and by 0.4% ethyl *p*-aminobenzoate acting for 2-4 hours. Rotation of the mitotic spindle was the weakest detectable response.—Ivor Cornman.

47. Goodspeed, T. H. (U. California, Berkeley.) Cytotaxonomy of *Nicotiana*. *Bot. Rev.* 11(10): 533-592. 1945.—A review of the morphological, distributional and cytological information concerning the genus *Nicotiana* which has accumulated during the past 15 yrs., together with the cytotaxonomic conclusions which have been derived from this information. The material discussed is organized under the following headings: taxonomy, cytology, cytotaxonomy, summary and list of  $F_1$  hybrids. There is a bibliography of 157 citations.—F. T. Addicott.

48. Guinochet, M. Recherches de taxonomie expérimentale sur la flore des Alpes et la région méditerranéenne occidentale. I. Notes caryologiques sur quelques Graminées. *Rev. Cytol. Cytophysiol. Veg.* 6(1/4): 209-220. 3 fig. 1942-43.—Diploid numbers for 13 vars. are listed. Subsp. of *Anthoxanthum odoratum*, *Ammophila arenaria*, or *Avena elatior* had the same number of chromosomes. Unequal and odd numbers in *Poa* spp. show that ploidy and hybridization were active in species formation. The primitive spp. (low chromosome no.) are located in the Mediterranean basin.—Ivor Cornman.

49. Håkansson, Artur. Die Meiosis einiger *Godetia*-Bastarde. [Meiosis of some *Godetia* hybrids.] *Bot. Notiser* 1943(2): 271-283. 3 fig. 1943.—*G. nutans* ( $n = 14$ ) × *G. amoena* ( $n = 7$ ) had 7 II + 7 I, or more often, 6 II + 9 I or 5 II + 11 I. The *amoena* chromosomes pair with chromosomes of the *whitneyi*-like genome of *G. nutans*. *G. whitneyi* ( $n = 7$ ) × *G. deflexa* ( $n = 9$ ) had 16 I; the univalents do not divide at anaphase 1, but are distributed to the poles of the spindle. A restitution nucleus is only rarely formed. The chromosomes then divide at anaphase 2. *G. whitneyi*, tetraploid ( $n = 14$ ) × *G. deflexa* ( $n = 7$ ) had 7 II + 9 I. At anaphase 1 the *deflexa* univalents behave in a different manner than in the hybrid last mentioned: the univalents divide and the chromatids pass to opposite poles. *G. whitneyi* ( $n = 7$ ) × *G. bottae* ( $n = 9$ ) had 16 I. *G. bottae* has very small chromosomes, and in the hybrid 9 I were small and 7 large. Thus, the chromosome sizes of the parent spp. were retained in the hybrid. The univalents are distributed to the poles of the spindle, lagging chromosomes are often observed and rather often a restitution nucleus is formed in this hybrid. Of the parent spp. *amoena*, *whitneyi*, *nutans* belong to one group of *Godetia* spp., *deflexa* and *bottae* to another. (Hiorth, 1941).—Artur Håkansson.

50. Hsu, T. C., and T. T. Liu. (National U. Chekiang, China.) Meiosis of the autotriploid *Hemerocallis fulva*. *Kwangsi Agric.* 4: 368-375. 1943.—The cultivated orange daylily, *H. fulva*, is found as an autotriploid, the basic chromosome number of which is 11. In the 1st metaphase of the meiotic division during the microsporogenesis of the plant, there are frequently found 1-4 univalents, which subsequently lag behind in the anaphase. These laggards usually form micronuclei in the succeeding stages, and they consequently become minute spores in the tetrad stage. The resulting pollen grains can be grouped into 2 distinct classes: the one

normal in appearance and much larger, and the other very small, round and completely abortive. Only about 9% of the pollen grains germinate in artificial media. The cause of sterility here is apparently due to meiotic irregularities rather than to factorial interactions.—*Courtesy Poultry Sci.*

51. McDonough, E. S. (Marquette U., Milwaukee, Wis.) The cytology of *Sclerospora macrospora* (Sacc.) in relation to its taxonomic position. *Amer. Jour. Bot.* 33(3): 220. 1946.—An abstract.

52. Newcomer, Earl H. (U. North Carolina, Chapel Hill.) The duality of mitochondria in plants. *Amer. Jour. Bot.* 33(3): 221. 1946.—An abstract.

53. Nygren, A. (Inst. of Genetics, Svalöf, Sweden.) The genesis of some Scandinavian species of *Calamagrostis*. *Hereditas* 32: 131-262. 1946.—*Calamagrostis* contains both amphimictic and apomictic spp. Of the amphimictic spp. *C. arundinacea*, *canescens*, *neglecta* and *varia* are tetraploid ( $2n = 28$ ), while *C. epigeios* is tetraploid, hexaploid or octoploid. The amphimicts are cross-fertilizers. In *C. epigeios* pseudofertility occurs. A hexaploid hybrid between *C. arundinacea* and *C. epigeios* ( $2n = 56$ ) shows the same type of mitotic division in E. M. C.'s found in the apomictic spp. The apomicts are: *C. chalybaea* ( $2n = 42$ ), *C. lapponica* ( $2n = 42-112$ ), *C. purpurea* ( $2n = 56-91$ ) and 3 investigated types of *C. canadensis* from Canada. *C. lapponica* forms pollen, while only 1 of 174 *C. purpurea* clones had this property, and *C. chalybaea* does not develop pollen. Plasmidia are formed in the loculi of all 3 spp. Meiosis in P. M. C.'s of *C. lapponica* is disturbed, in *C. purpurea* semiheterotypic division occurs, while *C. chalybaea* shows mitosis. In *C. purpurea* mitotic divisions are found in delayed P. M. C.'s. The development of meiosis and mitosis in P. M. C.'s and E. M. C.'s of *C. purpurea* is influenced by external factors. In different yrs. the same plant may form different percentages of cells with meiotic or mitotic division. *C. purpurea* has been synthesized partly by colchicine treatment of seeds from *C. canescens* and by hybridization between *C. canescens* and *C. epigeios* ( $2n = 42$ ). The synthesized plants are apomicts ( $2n = 56$ ). The species *C. purpurea* has arisen as a consequence of intra- and inter-specific hybridizations in combination with polyploidy.—A. Nygren.

54. Philips, H. M. (Emory U., Ga.) The formation of nucleoli in *Erythronium*. *Amer. Jour. Bot.* 33(3): 222. 1946.—An abstract.

55. Philips, H. M., and Carolyn Wood Forman. (Emory U., Ga.) Desynapsis in *Erythronium californicum* Purd. *Amer. Jour. Bot.* 33(3): 222. 1946.—An abstract.

56. Warnke, H. E. (Carnegie Inst., Cold Spring Harbor, N. Y.) A study of spontaneous breakage of the Y chromosome in *Melandrium*. *Amer. Jour. Bot.* 33(3): 224. 1946.—An abstract.

57. Witkus, E. Ruth. (Fordham U., N. Y. C.) Naturally occurring polyploid mitosis in the normal development of *Allium cepa*. *Amer. Jour. Bot.* 33(3): 224-225. 1946.—An abstract.

58. Woods, M. W. (U. Maryland, College Park, Md.), and H. B. Du Buy. Further studies on plastid variegations. *Amer. Jour. Bot.* 33(3): 225. 1946.—An abstract.

59. Yakar, N. (U. Istanbul, Turkey.) Nombre de chromosomes et problème de la relation nucléo-plasmique chez *Digitalis ferruginea* L. et *Digitalis purpurea* L. *Istanbul Üniversitesi Fen Fakültesi Mecmuası (Rev. Fac. Sci. Univ. Istanbul) Ser. B. Sci. Nat.* 10(4): 299-308. 1945.—Numerous measurements of all types of leaf cells showed that *D. ferruginea* has consistently larger cells than *D. purpurea*, the ratio of cell volumes averaging about 2:1. The majority of counts made on pollen mother cells showed 28 chromosomes in *D. purpurea* and 35 in *D. ferruginea* (haploid condition). The 28 pairs of chromosomes had an average volume of  $4.3 \mu^3$ , and the 35 pairs averaged  $12.2 \mu^3$ .—R. W. Pennak.

#### ANIMAL

60. Hinton, Taylor. (Northwestern U., Evanston, Ill.) The physical forces involved in somatic pairing in the diptera. *Jour. Exptl. Zool.* 102(3): 237-248. 3 pl. 1946.—With the aid of translocations in the chromosomes of *Drosophila melanogaster*, somatic pairing was studied in detail. It is demonstrated that specific pairing between homologous regions occurs, regardless of their position in the chromosomal configuration. This is especially striking when the elastic

secondary constriction of the 2d chromosome is stretched out to make the pairing possible. Pairing is shown to begin at a time when the chromosomes are separated by distances too great for short distance chemical interactions to operate. Therefore, some type of long range specific attractive force must be involved.—Auth. (courtesy Wistar Bibl. Serv.).

61. Holtfreter, Johannes. (McGill U., Montreal, Canada.) Structure, motility and locomotion in isolated embryonic amphibian cells. *Jour. Morphol.* 79(1): 27-62. 26 fig. 1946.—The structure of the early embryonic amphibian cell resembles that of Amoeba. It consists of 4 concentrically arranged layers: plasmasol, plasmagel, ectoplasmic fluid, and external membrane (plasmalemma). When isolated in isotonic salt soln., the cells form pseudopodia of various shapes and exhibit locomotion. Due to an inherent monaxial polarity, the cell may stretch into a cylindrical body furnished with an anterior hyaline cap and a posterior tail knob. The cell progresses by means of annular constrictions, moving backwards over the cell surface, and of periodic longitudinal expansions of the anterior body portion, combined with contractions of the posterior portion. These movements may occur in the absence of a sol-gel formation and of axial currents of the endoplasm. Purely ectoplasmic cellular fragments may exhibit the same coordinated movements as do whole cells, showing that the amoeboid movements are initiated and executed by the cell membrane. Local differences of surface tension and contractions of the plasmagel can be dispensed with as causative factors, the movements being probably due to alternate states of hydration of phosphatide layers present in the plasmalemma. Cell division is interpreted as resulting from an annular constriction of the latter.—Auth. (courtesy Wistar Bibl. Serv.).

62. Hsu, T. C. (National U. Chekiang, China.) The chromosomes of *Drosophila repletoidea*. *Kwangsi Agric.* 4: 155-160. 1943.—*D. repletoidea* is a new sp. of *Drosophila* found in Meitan, Kweichow. The metaphase plate in ganglion cells reveals 2 pairs of V-shaped, 1 pair of J-shaped and 1 pair of dot-like chromosomes. The salivary-gland chromosomes are loosely associated in the chromocentral region, presumably due to relatively small aunts. of heterochromatin in their proximal regions. Terminal association of the tips of the various arms was observed, but is not specific as shown by the random combinations of the different ends. One of the strains of the sp. was found to bear an inversion in one of the autosomes, probably of spontaneous origin in nature.—*Courtesy Poultry Sci.*

63. Kaufmann, Berwind P. (Carnegie Inst. Washington, Cold Spring Harbor, N. Y.) Organization of the chromosome. I. Break distribution and chromosome recombination in *Drosophila melanogaster*. *Jour. Exptl. Zool.* 102(3): 293-320. 1946.—Chromosome rearrangements obtained following x-ray treatment of mature spermatozoa of *D. melanogaster* have been used in analyzing the distribution of breaks along the X chromosome, and in determining the frequency with which rearrangement occurs within the X chromosome as compared with exchange between the X and the autosomes. The non-random distribution of breaks with respect to length of salivary-gland chromosome has permitted localization of intercalary heterochromatic regions. Analysis of patterns of recombination of the 2-break, 3-break, 4-break, and multiple-break rearrangements indicated that the intrachromosomal types were more frequent than expected on the basis of random break distribution and recombination. Recombination within the X chromosome was measured by comparing numbers of inversions of different lengths. Calculations based on length in number of subdivisions suggest that a pattern of coiling may exist within the X chromosome at the time of recombination that increases slightly the opportunities for reunion of regions that are separated by the distance of the turn of the coil. No evidence was obtained of preferential recombination between the proximal and intercalary heterochromatic regions, or among the intercalary heterochromatic regions.—Auth. (courtesy Wistar Bibl. Serv.).

64. Mickey, George H. (Louisiana State U., Baton Rouge.) Synapsis and behavior of chromosomes in polyploid male germ cells of *Romalea microptera*, Beauv. *Genetics* 30(1): 15. 1945.—An abstract.

65. Salazar, A. L. (U. Porto, Portugal.) "Centro de Estudos Microscópicos do Instituto para a Alta Cultura" Université de Porto, Portugal. Résumé des travaux réalisés

depuis 1941 jusqu'à 1945. 23p. Univ. Porto: Porto, 1945.—A review of the work done at this institute, with bibliography.

66. Schwarz, Emil. (*Michael Reese Hosp., Chicago.*) Cellular gigantism and pluripolar mitosis in human hematopoiesis. *Amer. Jour. Anat.* 79(1): 75-111. 4 pl. 1946.—Giant erythrocytes and giant leucocytes are exceptional findings in human blood and bone marrow. They are independent of type or morbid condition of hematopoiesis. These giant cells originate from bivalent ancestors formed by karyokinesis without cytokinesis, which carry 2 nuclei and 2 sets of centrioles. Repetition of this mechanism results in pluripolar mitosis and plurinucleated giant erythroblasts. These cells represent true gigantism, not hypertrophy. Segmentation in pluripolar mitosis is rarely total, frequently partial or absent. Cytokinesis is often delayed and resumed after the telophase. This recovery and the isolated, asymptomatic occurrence of gigantism suggest that a localized extracellular and temporary agent is responsible for the inhibition. The nature of the factor remains obscure. Pluripolar mitosis never increases the issue but at most makes up, in the case of total segmentation, for the loss of progeny in former generations. Gigantism does not interfere with nuclear maturation, or with the production of hemoglobin or the specific granules of leucocytes. Denucleation transforms the giant erythroblast into a giantocyte, the dimensions of which (18-45  $\mu$ ) vary directly with the plurinuclearity. Large plurivalent erythroblasts may also result from interrupted mitosis. Several types of this disorder are described. Exaggerated growth tendency gives rise to univalent erythroblasts and large erythrocytes but not to isolated gigantism.—*Auth. (courtesy Wistar Bibl. Serv.).*

66A. Serra, J. A., et A. Queiroz Lopes. (*U. Coimbra, Portugal.*) Données pour une cytophysiologie du nucléole. I. L'activité nucléolaire pendant la croissance de l'oocyte chez des Helicidae. *Portugaliae Acta Biol., Ser. A.* 1(2): 51-94. 1945.—A study of the morphological and histochemical changes in the nucleolus during the growth periods of the oocytes in 2 species of snails, *Helix aspersa* and *Tachea nemoralis*. The methods used include observations of the hermaphrodite glands in vitro, histological staining procedures, histochemical reactions (Feulgen reaction, reaction for nucleic acid phosphorus, lipid stains, detn. of isoelectric points by using basic and acid stains, reaction for SH groups, modified Millon reaction, ninhydrin reaction, arginine reaction, and tryptophane reaction) and nuclease digestion. At the end of the first growth period, the nucleoli (sometimes 4 at the beginning) are reduced to one. In vitro observations show that during the longer 2d growth period the nucleolus greatly increases in size and produces small nucleoli by budding at its surface. The small nucleoli dissolve afterwards in the karyolymph. During the 2d growth period the conc. of nucleotides (ribo) in the principal nucleolus is reduced and the amt. of proteins increased. No lipids have been found in the nucleolus. During the period of nucleolar budding the conc. of basic proteins in the principal nucleolus increases 3-fold while the non-basic proteins increase only 50%. In the principal nucleolus are inclusions which have about the same density as the nucleolus. These are interpreted as regions of greater conc. of nucleotides and polypeptides since they give more intense acidic and phosphorus reactions but contain less protein. The SH test is less intense in the nucleolus than in the nuclear sap and does not vary during the cycle of production of small nucleoli. The data are interpreted as indicating that the principal nucleolus receives simple compounds from the cytoplasm and elaborates them to nucleoproteins, composed of basic (and non-basic) proteins, and ribonucleotides. The small nucleoli carry these complexes

through the karyolymph to the cytoplasm where they act as centers for cytoplasmic syntheses during oocyte growth.

67. Stefanelli, Alberto. Il rapporto nucleo-plasmatico e la sintesi dell'acido timonucleinico nello sviluppo. Ricerche sui Nematodi (*Rhabditis pellio* Bütschli). [The nucleoplasmatic relation and the synthesis of the thymonucleic acid in development. Researches on nematoda (*R. pellio*).] *Arch. Zool. Ital.* 28: 387-419. 8 fig. 1940.—The behavior of the cleavage nuclei was studied in the eggs of *R. pellio*. In this species that is no increase in the whole nuclear volume during the cleavage period, in opposition to Loeb's hypothesis. At the 8th generation (about 250 blastomeres) cleavage ends, and histological differentiation of the larva begins. By application of Feulgen's micro chemical method it was revealed that the synthesis of thymonucleic acid occurs in the absence of volumetric variations.—*I. L. Coifmann.*

67A. Sze, Li-Chieh. (*Nation. U., Chekiang, China.*) Cytological studies on Acrididae. IV. The structure of the X-chromosome in the meiosis of *Phlaeoba infumata*. *Jour. Morphol.* 79(1): 113-121. 2 pl. 1946.—In harmony with the observations of others, the X-chromosome shows a spiral structure in spermatogonial divisions. Contrary to previous reports of the absence of spiralization of this element in meiosis, the present observations show a spiral structure in this chromosome in occasional examples from the diplotene stage. In the metaphase and anaphase of the 1st spermatocyte division the X-chromosome assumes either a compact, deeply-stained or a lightly-stained, granular condition. In the metaphase of the 2d division all chromosomes are invariably coiled and the X-chromosome cannot be identified. A coiled condition was also seen in spermatids both in the X and the P chromosomes. Together with the data obtained by previous workers, the present observations justify the conclusion that all chromosomes are spiralized in all phases of the nuclear cycle, irrespective of their being heteropynotic or not. It is believed that both the general similarity and the difference in behavior of heteropynotic and non-heteropynotic chromonemata are conditioned by the chemical nature of their respective frameworks and the physiological condition of the cell in which they are embedded.—*Auth. (courtesy Wistar Bibl. Serv.).*

68. Torelli, Beatrice. Osservazioni sulla spermatogenesi. I. [Observations on spermatogenesis. I.] *Arch. Zool. Ital.* 28: 231-245. 1940.—A study of spermatogenesis in 2 Orthoptera (*Homorocoryphus nitidulus* and *Pamphagus marmoratus*) with special reference to the heterochromosome.—*I. L. Coifmann.*

68A. White, M. J. D. (*Univ. Coll., London, England.*) The spermatogenesis of hybrids between *Triturus cristatus* and *T. marmoratus* (Urodela). *Jour. Exptl. Zool.* 102(2): 179-205. 2 pl., 8 fig. 1946.—In various kinds of hybrids between *T. cristatus* and *T. marmoratus* the ♀♀ are generally fertile, the ♂♂ entirely sterile. This sterility seems to depend on 2 factors—failure of pairing of the chromosomes in the hybrids and degeneration of the spermatids. The number of bivalents seen at meiosis in the hybrids is markedly lower than in the pure spp. and the number of chiasmata per bivalent is also lower. A comparison of F<sub>1</sub> hybrids and "double back cross" newts (ones with approx.  $\frac{5}{8}$  of their chromosome set from one sp. and  $\frac{3}{8}$  from the other) suggests that the sterility of the ♂ hybrids depends on the interaction of a number of genes, as in the *Drosophila pseudoobscura* × *D. persimilis* hybrids studied by Dobzhansky. The bearing of these results on the problem of natural hybridization between *T. cristatus* and *T. marmoratus* in Central France is discussed.—*Auth. (courtesy Wistar Bibl. Serv.).*

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 39, 47, 101, 171, 355, 731, 846, 869, 877, 913, 1086, 1094, 1107, 1110, 1139, 1590, 1670, 1694, 1695, 1700, 1701, 1797, 1950, 1953, 2032, 2039, 2040, 2041, 2042, 2049, 2075)

### GENERAL

69. Hudson, P. S., and R. H. Richens. The new genetics in the Soviet Union. 1-88. Imperial Bureau of Plant Breeding and Genetics: Cambridge, England, 1946.—This is an objectively written critical review of the progress of genetics

in the Soviet Union. The review deals mainly with the origins and theories of the Michurin-Lysenko school of geneticists. An extensive bibliography (7pp.), mainly of Russian articles, is provided.



## PLANT

70. Adair, C. Roy (U. S. Dept. Agric., Stuttgart, Ark.), and Jenkin W. Jones. (U. S. Dept. Agric., Beltsville, Md.) Effect of environment on the characteristics of plants surviving in bulk hybrid populations of rice. *Jour. Amer. Soc. Agron.* 38(8): 708-716. 1946.—The frequency of survival of several plant characters in 3 bulk hybrid populations grown for 8 generations in Arkansas, Texas, and California, then grown and studied at Stuttgart, Ark., is reported. The plants from seed grown in California lots headed earliest and from Texas lots the latest. Plants from Arkansas seed were tallest and those from California shortest. The final proportion of the different grain types in the 3 lots from the 3 stations was rather variable. Plants of each grain type, however, survived at each station. Awnless plants, preferred by growers, were most numerous in all lots, and for corresponding lots the proportion of awnless plants was higher for Arkansas than for the California and Texas material. The bulk hybrid method can be used to advantage in breeding for disease resistance, for large populations can be readily grown and hence the possibility of obtaining the desired recombination of agronomic characters combined with disease resistance is materially improved. The  $\chi^2$  test indicated an association between the date of heading and plant height in all lots except one, and in 5 of the 9 lots between date of heading and grain type. These characters are of economic importance.—*Authors.*

71. Alfaro, Alonso Calatrava. Un nuevo caracter adherente en maiz. [A new adherent character in maize.] *Inst. Fitotec. Sanata Catalina* 4: 28-39. 1944.—The appearance of an adherent character in maize different from those characters for twisting described by Eyster and Kvan is described. *AD*, is inherited independently of *Ts<sub>2</sub>-P-Br-F<sub>1</sub>-BM<sub>2</sub>*, which is located on chromosome 1, and therefore the new character cannot be the *ad<sub>1</sub>* of Kempton. The character is also inherited independently of *Su<sub>1</sub>-Tu-gl<sub>3</sub>* on chromosome 4.—*F. L. Wynd.*

72. Ashton, T. The use of heterosis in the production of agricultural and horticultural crops. 30p. Imperial Bur. Plant Breeding and Genetics: Cambridge, England 1946.—The author gives a critical review of recent literature on heterosis as influencing the production of crop plants and forest trees. The plants are discussed under 4 different groups. I. Self-pollinated plants considered are wheat, oats, barley, sorghum, rice, cotton, tobacco, peppers, tomato, eggplant, and legumes. II. Cross-pollinated plants discussed are rye, maize forage crops, forage grasses, lucerne, hemp, abacá, sugar beet, sunflower, carrot, radish, onion, cabbage, spinach, cucurbits, muskmelon, watermelon, pumpkin, squash, marrow and cucumber. III. Asexually propagated plants given consideration are potato, sugar cane, strawberry, and grape. IV. Forest trees given attention are birch, sweet chestnut, walnut, larch, pine, poplar, and oak. A well-selected bibliography is given.—*H. A. Jones.*

73. Bateman, A. J. (John Innes Hort. Inst., London.) Genetical aspects of seed growing. *Nature [London]* 157: 752. 1946.—The author discusses the British war-time problem of maintaining the quality and yield of varietal seed standards. Isolation distances for many crops and zoning schemes were introduced to prevent admixture of different vars. during natural pollination. He discusses the relationship of contamination to seed production for commercial purposes, the seedsman and the specialist plant breeder; the difficulties which may be encountered in eliminating hybrid vars. in elite seed to below a level comparable with the natural internal variability of the var. He discusses the problem of minimum and safe isolation distances and reviews some of the valuable work done by the Russians; of the factors affecting isolation, he stresses the relative compatibility of contaminant and non-contaminant pollen and pollen conc. Finally he describes some work proceeding at the John Innes Institution on turnip, radish, beet and maize regarding the effect of isolation distance on contamination, the latter decreasing rapidly at first and then more gradually down to 1% at 50 ft. or so.—*Simon Seville.*

74. Burnham, C. R. (Agric. Expt. Sta., St. Paul, Minn.) An "Oenothera" or multiple translocation method of establishing homozygous lines. *Jour. Amer. Soc. Agron.* 38(8): 702-707. 1946.—This method is proposed for making gametic combinations homozygous immediately. It is based on the fact that in a plant having at meiosis a large ring containing

the entire diploid set of chromosomes, only the parental combinations of chromosomes, for the most part, produce functional spores. By self-pollination, plants homozygous for these parental combinations could be obtained. Crosses for the production of such a multiple translocation stock in corn are in progress. When available this line will be crossed with the heterozygous stock from which inbreds are desired. Each resulting *F<sub>1</sub>* plant represents a different gamete from the heterozygous stock combined with the multiple translocation gamete. By self-pollination each gametic combination from the heterozygous source would be established immediately in homozygous condition. These lines, recognizable by proper tests, could be used immediately in breeding trials. Possible difficulties in producing such a multiple translocation or "Oenothera" stock, its application to corn and barley breeding, as well as possible sources of heterozygosity in the homozygous lines established by the method are considered. The use of haploids as another method of producing homozygous lines is also considered feasible in corn if carried out on an adequate scale.—*C. R. Burnham.*

75. Cartwright, W. B. (U. S. Dept. Agric., Lafayette, Ind.), and R. G. Shands. (U. S. Dept. Agric., Madison, Wis.) Resistance to the Hessian fly in crosses of some common spring wheats. *Jour. Amer. Soc. Agron.* 38(9): 845-847. 1946.—Segregating populations from crosses between vars. or strains of common spring wheats, *Triticum vulgare*, were studied for their resistance to Hessian fly, *Phytophaga destructor*. The vars. Beirao (P.I. 56202-2 and P.I. 56202-5), Portugez (P.I. 56204-7), Barbella-Santa Martha (P.I. 56222-13), Lobeiro-Barbella (P.I. 56225-1), unnamed (P.I. 94379-6), unnamed (P.I. 94549-5), unnamed (P.I. 94571-14), Triunfo (P.I. 104138-3), unnamed (P.I. 111245-10), and unnamed (P.I. 125390-8) were crossed with W38. Previous tests at Lafayette, Ind., showed all of these wheats resistant to Hessian fly. *F<sub>2</sub>* and *F<sub>3</sub>* plant populations of these crosses in the 1-leaf stage were exposed to an unselected fly population occurring at Lafayette, Ind. Eggs were laid abundantly on all plants. Plants were examined 3 weeks later and classified for the presence or absence of fly puparia. No genetic interpretation could be made from data on *F<sub>2</sub>* plants. The distribution of *F<sub>3</sub>* families for fly infestation in 5 crosses showed a wider range than in the parents. In crosses involving Beirao (P.I. 56202-5), Portugez (P.I. 56204-7), Barbella-Santa Martha (P.I. 56222-13), unnamed (P.I. 94549-5), and unnamed (P.I. 94571-14), with W38 there were 5.7, 10.9, 8.7, 7.5, and 5.6% of the total families, respectively, that reacted completely susceptible. This indicated that at least 2 major genes were involved in each cross, one gene from W38, and one and possibly more genes by the other parent in the respective crosses. Vars. in the remaining crosses apparently possess the H3 factor (or an allele) for fly resistance previously reported in W38.—*Authors.*

76. Horowitz, N. H., M. B. Houlahan, M. G. Hungate, and B. Wright. (Stanford U., Calif.) Mustard gas mutations in Neurospora. *Science* 104(2697): 233-234. 1946.—Asexual spores of wild-type 1A of *N. crassa* were exposed to  $\beta$ , $\beta'$ -dichlorodiethylsulfide, and applied to protoperithecia of wild-type strain E5297a. The same cross was made with untreated spores. Following fusion and development, single ascospores were isolated on "complete" medium for germination. Of 760 treated spores which germinated, 29 were mutants. In the controls, 769 spores germinated and 1 was a doubtful mutant. The 29 mutants included 17 visible and 12 biochemical mutants. The frequency of mutant spores compared favorably with that obtained after u.-v. irradiation. The actual mutation rate was close to twice the % of mutants found. One of the mutants, the "albino," appeared to be a new type and had a yellow tint. No new kinds of growth factor requirements were identified among the biochemical mutants.—*H. M. Kaplan.*

77. Lindegren, Carl C., and Gertrude Lindegren. (Washington U., St. Louis, Mo.) A new method for hybridizing yeast. *Proc. Nation. Acad. Sci. U. S. A.* 29(10): 306-308. 1 fig. 1943.

78. Pal, B. P. (Imperial Agric. Res. Inst., New Delhi, India.) Degeneration of improved crops in India. *Indian Farming* 3(5): 261-264. 1942.—Deterioration of improved vars. results from genetic as well as non-genetic causes. Segregation may occur in new vars., or the improved strains become contaminated by natural crossing. New crops grown



in environments for which they were not intended may fail to perform satisfactorily due to such factors as soil, moisture, or climatic differences or to diseases or insects in the new environment. They may also show deterioration due to mechanical mixture with inferior varieties. Precautions against these must be taken and it is necessary, in addition, to maintain foundation seed stocks.—K. L. Anderson.

79. Palma, Silvia E. (Inst. Fitotechnico, Santa Catalina.) Estudio de algunas quimeras vegetales. [Study of some plant chimeras.] *An. Inst. Fitotec. Santa Catalina* 4: 75-103. 41 fig. 1944.—Chimeras of *Ligustrum lucidum*, *Citrus* (off. *Aurantium* and off. *medica*) and *Dianthus caryophyllus* Juan Marie were studied. In *Ligustrum*, the cells of leaves with mottled areas contained colorless or light yellow plastids, but no chloroplasts. Cells of the 1st layer of palisade parenchyma were  $< \frac{1}{2}$  the length of those in corresponding green tissue. The thickness of the leaves was the same for both chlorotic and green tissues. The chimeral type was found to be sectorial. Genetic behavior of seedlings from seeds obtained by self-pollination indicated that the origin of chlorotic tissues was neither expression of a mendelian character nor the result of an infection. It is suggested that the origin of the chimera might be explained as much by the natural variability of the plastids as by the influence of a genetic factor. Histological examination of the twigs and leaves of a citrus chimera indicated that both structures lacked chlorophyll in the subepidermis. The colorless or light yellow plastids of chlorotic areas of leaves and twigs were less numerous than in green tissue, and appeared to be incompletely developed and smaller. In the palisade parenchyma, chloroplasts were found in the 2d or 3d layer of cells of some leaves, but none were observed in others. Chloroplasts were also frequently lacking in the spongy parenchyma. Histological data suggested that this chimera was of a periclinal diclameous structure, an observation said to be confirmed by the genetic behavior of the seedlings from chimera fruits, and fruits from branches with green and mottled foliage respectively. It is suggested that the phenotypic change associated with chimera petals of *Dianthus* is due to a genotypic change produced by the mutation of either *yaY* in the genotype *yIA SrM*, or *aaa* in the genotype *YIa srM*.—W. B. Drew.

80. Richey, Frederick D. (Agric. Expt. Sta., Knoxville, Tenn.) Hybrid vigor and corn breeding. *Jour. Amer. Soc. Agron.* 38(9): 833-841. 1946.—Some of the facts and theories as to the genetic basis for hybrid vigor and its relation to corn breeding are reviewed and examined. It is concluded (a) that the interaction of dominant favorable genes remains the most probable explanation for hybrid vigor, (b) that the relative importance of hybrid vigor and of inherent productiveness as causes of the high yields of corn hybrids is not known, but (c) that the evidence continues to accumulate that the highest yields tend to be obtained when the best products of selection are used in hybrid combination.—F. D. Richey.

81. Smith, D. C., and E. L. Nielsen. (Agric. Expt. Sta., Madison, Wis.) Comparative breeding behavior of progenies from enclosed and open-pollinated panicles of *Poa pratensis* L. *Jour. Amer. Soc. Agron.* 38(9): 804-809. 1946.—Two groups of progenies, developed from seed where pollination was controlled by bagging, were studied. The number and vigor of seedlings developed from enclosed and open-pollinated panicles suggested some reduction in both vigor and the number of seedlings resulting from controlled pollination. However, these differences appeared to have uncertain significance. Generally, no important differences were found in adult plant variation between progenies from seed derived from enclosed and those obtained from open-pollinated panicles. It appears that the nature of pollination, either open or self, is of little importance in determining whether seed development will result from apomictic or sexual processes.—E. L. Nielsen.

82. Tavares, Heitor. Melhoramento do algodoeiro Mocó. [Improvement of Mocó cotton.] *Bol. Sec. Agric., Indústria e Comércio [Pernambuco]* 11(1/2): 7-13. 1944.—A report on the method used in breeding expts. aimed at improving Mocó cotton (*Gossypium purpurascens*) in Pernambuco.—W. G. Houk.

#### ANIMAL (EXCEPT MAN)

83. Bozkurt, B. (U. Istanbul, Turkey.) Über sterilität bei Zahnkarpfenbastarden. (Untersuchungen an der Gattung

*Aphyosemion*.) *Istanbul Univ. Fen Fakültesi Mecmuası (Rev. Fac. Sci. Univ. Istanbul) Ser. B. Sci. Nat.* 10(3): 143-163. 1945.—Crosses between *Aphyosemion bivittatum* and *A. splendopleuris* produced hybrid ♂♂, ♀♀, and intersexes, all of which were sterile. In both the ♀♀ and ♂♂ the gonads develop very slowly and never reach maturity during the life span. Both ♂ and ♀ characters are present in the gonads of intersexes; the former are more prominent in the early developmental stages but are later largely obscured by follicular and thecal cells which surround degenerating oocytes. The histology and cytology of the hybrid gonads are described in detail.—R. W. Pennak.

84. Castle, W. E. (U. California, Berkeley.) Mink mutation varieties. *Jour. Heredity* 37(7): 215. 1946.—The author retracts several genetic symbols published by Castle and Moore (*Jour. Heredity* 37(5): 137). The error occurred when a paper published by other authors on the same subject (*Jour. Heredity* 32(5): 1941) was overlooked.—L. M. Dickerson.

85. Jones, D. G., and F. B. Hutt. (Cornell U. Agric. Expt. Sta., Ithaca, N. Y.) Multiple alleles affecting feathering in the fowl. *Jour. Heredity* 37(7): 197-205. 4 fig. 1946.—A mutation, tardy, in White Leghorns was found to prevent manifestation of the sex-linked type of rapid feathering characteristic of chicks of that breed. It causes slow development of the tail, of secondary feathers of the wing, and of contour feathers over the body. It is recognizable between 10 days and 8 weeks of age, and has no effect on the plumage of adult birds. This condition is caused by a recessive autosomal gene, *t*, when homozygous. By suitable breeding tests, it was found that tardy is a recessive allele of the mutation, retarded, previously reported by Warren, to which the symbol *t* is now assigned. These 2 genes with their dominant, wild-type allele, *T*, thus comprise a series of multiple alleles. This is the 2d such series to be identified in the fowl.—F. B. Hutt.

86. Kosswig, C., and A. Sengün. (U. Istanbul, Turkey.) Über arttrennende Mechanismen. *Istanbul Univ. Fen Fakültesi Mecmuası (Rev. Fac. Sci. Univ. Istanbul) Ser. B. Sci. Nat.* 10(3): 164-214. 1945.—Extensive breeding expts. with *Xiphophorus helleri*, *Platyphoecilus maculatus*, *P. variatus*, and *P. siphidium* are reviewed from the literature and original work, with particular reference to sex-linked characters. It is concluded that a wide variety of phenomena are probably instrumental in speciation in these and related fishes; some of these are: differential fertilization potentialities of sperm, hybrid unisexuality, precocious sexual development, delayed sexual maturity, abnormal sex ratios, lethal genes, and intersexuality.—R. W. Pennak.

87. McGibbon, W. H. (U. Wisconsin, Madison.) The inheritance of short lower mandible in the fowl. *Poultry Sci.* 25(4): 406. 1946.—An abstract.

88. McGibbon, W. H., and J. G. Halpin. (U. Wisconsin, Madison.) Three alleles affecting completeness of feathering in the chicken. *Poultry Sci.* 25(4): 406-407. 1946.—An abstract.

89. McGovern, Beulah H., Morris H. Harnly, and Jeanne Gable. (New York U., N. Y. C.) A new approach to the pattern problem in *Drosophila* wings. *Jour. Exptl. Zool.* 102(2): 159-177. 1946.—Adult wings of 7 genotypes raised at intervals between 16° and 32°C, were examined. The following controlling factors are offered to explain the graded changes in wing pattern common to the temp. phenotypes of these genotypes: 1) Interruption in the marginal vein, especially distally, disrupts the normal vein positions in the distal and lateral wing parts. The proximal venation is not affected, apparently because the cross veins tend to preserve the spatial relations of the longitudinal veins. 2) Wing lengthening with decrease in temp. accentuates the venation abnormalities that accompany marginal vein defects. A relatively great phenotype change is ascribed to alteration in internal wing tension caused by these 2 factors. 3) Area changes are not proportional to the changed surface distribution required when the venation is distorted by marginal vein defects and increased length, whole regions of the wing are not completed. However, in the incomplete wing, the spatial relations of the parts present are the same as in more complete wings. The order in which the wing pattern is completed is not random but is related to wing ontogeny in time. That a given area-size relationship results in a predictable grade of pattern completeness regardless of temp. of genotype can be inter-

preted as normal organogenesis limited by the supply or nature of the organ-forming material.—*Auth. (courtesy Wistar Bibl. Serv.)*.

90. Mead, S. W., P. W. Gregory, and W. M. Regan. A recurrent mutation of dominant achondroplasia in cattle. *Jour. Heredity* 37(6): 183-188. 2 fig. 1946.—A dominant mutation that reduces skeletal development was found in cattle. Heterozygous animals may be recognized by lack of height, occasioned largely by short legs. Mature heterozygous animals are compared, as to body measurements, with normal sibs of the same age. In the homozygous state there is marked achondroplasia, which is lethal. There were no mating tests; but the condition coincides so closely with the dominant achondroplasia of the Dexter lethal that the 2 are assumed to be identical. The mutation occurred spontaneously in 1 bull whose parents were normal in size.—*S. W. Mead*.

91. Mueller, C. D., and F. B. Hutt. (Cornell U., Ithaca, N. Y.) The numbers of daughters necessary for progeny tests in the fowl. *Poultry Sci.* 25(3): 246-255. 1946.—Analyses of the records of 86 sires, each of which had 50 daughters or more, showed that a little over 30 daughters were adequate for testing the viability of a sire's progeny when the mortality in the population ranged from 37 to 53% in the test period. With lower mortality a greater number of daughters is necessary for the differentiation of sires. For this purpose, a sample of 30-odd daughters hatched in the last half of a 9-weeks breeding season was practically as useful (under the conditions of this expt.) as a similar sample from the first 3 hatches. Both were adequate for revealing familial differences in resistance to a specific disease (lymphomatosis) when it killed 12.6% of the population or more, but not when it killed only 8%. The extent is shown to which samples of 30-odd daughters permitted differentiation of sires when only 1/3 of the test was completed, and the limitations of partial tests with small samples are discussed. It is concluded that tests of dams for viability of offspring are less reliable than those of sires because the numbers of daughters available from single dams in one season are usually too small for differentiation of families. The number of daughters needed for tests of egg production is much less than that required for tests of viability. Six daughters with completed records appear to be adequate for tests of dams for ability to transmit high fecundity.—*F. B. Hutt*.

92. Munro, S. S. A sex-linked true breeding blue plumage color. *Poultry Sci.* 25(4): 408-409. 1946.—An abstract.

93. Wald, George, and Gordon Allen. (Harvard U., Cambridge, Mass.) Fractionation of the eye pigments of *Drosophila melanogaster*. *Jour. Gen. Physiol.* 30(1): 41-46. 1946.—Eye pigments of normal and mutant types of *D. melanogaster* were extracted with water and fractionated by chromatographic adsorption on powdered talc. Spectra of all the fractions obtainable in soln. were measured and the general chemical behavior of the pigments is described. Two chemically distinct groups of pigments were found, to be identified with the earlier designated red and brown components. The red component in the wild-type eye contains 3 well defined pigments, 2 of them capable of further subdivision so that the total number of fractions obtained is 5. There is also present a brown component pigment which could not be treated quantitatively by the methods employed. All members of the wild-type red component are found in cinnabar eyes, unaccompanied by the brown component. Conversely, brown eyes contain a pigment indistinguishable from the

wild-type brown component, virtually alone. In sepia eyes, 1 red component and 2 brown component pigments can be distinguished, all 3 pigments differing from those of wild-type eyes. Pigments apparently identical with those found in wild-type *melanogaster* eyes have also been found in *D. virilis*.—*Authors*.

#### MAN

\*94. McGregor, I. S. Pedigree of nystagmus, myopia and congenital eye defects with mental deficiency. *Ann. Eugenics* 13(2): 135-40. 1946.—A family of 4 generations, made up of 42 persons in whom multiple eye defects such as microphthalmos, defects of conjunctiva, corneal opacities, cataract, coloboma of retina and optic nerve, myopia, optic atrophy and finally feeble-mindedness are present, is recorded. No defects were listed in the parents in the first generation, but 7 of 13 in the 2d generation, 4 of whom died in infancy before defects could be noted, were affected while in the 3d generation of 19 offspring with 3 dying in infancy, 10 were affected; and in the 4th of 8 persons, 1 died in infancy and 4 were affected. The nystagmus was inherited as a dominant, not transmitted by those not having it, but the multiple eye defects were limited to one male with nystagmus in the 2d generation, to 3 of his 4 offspring with nystagmus and again to 3 of his 4 grandchildren with nystagmus. In the others, the nystagmus occurred alone or in association only with myopia. Mental defect was present in the 2d generation only in one nystagmic and in one normal eyed person.—*M. T. Macklin*.

95. Marburg, Otto. Hereditary scleroses. *Arch. Neurol. and Psychiat.* 55(4): 338-352. 6 fig. 1946.—A brief discussion of the rôle of heredity in the determination of scleroses.—*R. R. Gates*.

96. Spear, Gerald S. (Harvard U., Cambridge, Mass.) The inheritance of flexed fingers. *Jour. Heredity* 37(6): 189-192. 2 fig. 1946.—The author has traced the inheritance of flexed fingers (camptodactyly or streblomicrodactyly) in his family through 5 generations. Individuals affected include 2 of his brothers, their mother, her brother and one of his children, his father, the latter's mother and her mother. No individual shows the trait if 1 parent did not show it before him. The fingers affected are not always the same. Some have shown the trait in but one hand, others in both. A clear association with hair color is revealed in the author's family as well as in another family showing a similar abnormality. Data are not adequate to prove linkage. In the cases observed by this author no individual affected with flexed fingers has light hair. Every affected individual has dark hair. Four individuals not showing the defect have light hair; 3 not showing it have dark hair. Of the affected individuals in the author's immediate family, the 1 whose fingers are least flexed, while possessed of what may be characterized as dark hair, has hair of a dark brown hue, while others affected have the very blackest of hair.—*G. S. Spear*.

97. Stratton, F. (Manchester Roy. Infirm., Eng.) A new Rh allelomorph. *Nature [London]* 158: 25. 1946.—Cells from a blood donor (Group O) were agglutinated by anti-c, anti-e and anti-E sera; but variable results were obtained with 32 strong anti-D sera; 12 were positive and the remainder were either negative or contained blocking anti-bodies to the test cells. Members of the donor's family were also tested and from the results obtained, the existence of a new allele *D<sup>u</sup>* at Fisher's *D-d* locus is suggested.—*Simon Seville*.

#### BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 139, 200, 328, 340, 356, 358, 414, 471, 527, 528, 539, 560, 565, 585, 609, 701, 746, 751, 789, 863, 910, 970, 1697, 1809, 2059)

98. Anderson, J. Ansel. (Board of Grain Commissioners for Canada, Winnipeg, Manitoba.) The role of statistics in technical papers. *Trans. Amer. Assoc. Cereal Chem.* 3(2): 69-73. 1945.

99. Crump, S. Lee. (Iowa State Coll., Ames.) The estimation of variance components in analysis of variance. *Biometrics Bull.* 2(1): 7-11. 1946.—Two uses of the analysis of variance are distinguished: to obtain tests of significance of treatment effects, and to provide estimates of the variance

components of the several effects contributing to the total variance. The hypotheses appropriate for each case, based on the same fundamental equation, are described. The author gives a general rule for determining the average values of any mean square from a multiple classification with equal subclass numbers. Rules for the variances of the estimated components are also given. The procedures are illustrated by an example.—*J. H. Watkins*.

100. Festinger, Leon. (Massachusetts Inst. Tech., Cam-

bridge.) The significance of difference between means without reference to the frequency distribution function. *Psychometrika* 11(2): 97-106. 1946.—Most existing tests of significance of difference between means require specific assumptions concerning the distribution function in the parent population. The need for a test which can be applied without making any such assumption is stressed. Such a statistical test is derived. The application of the test involves converting scores to rank orders. The exact probabilities may then be calculated for specified differences between samples by means of which the null hypothesis may be tested. The application of the test is simple and requires a minimum of calculation. The test loses in precision because of the conversion to rank orders but gains in generality since it may be safely used with any kind of distribution.—*Courtesy Psychometrika*.

101. Fisher, R. A. The fitting of gene frequencies to data on Rhesus reactions. *Ann. Eugenics* 13(2): 150-155. 1946.—This paper consisting largely of mathematical tables is impossible of abstraction. The summary as given in R. A. Fisher's words is as follows: "A method is given of dealing systematically with a classification in many phenotypes, the expectation of each of which is expressible in term of the proportionate frequencies of a number of alleles or gene combinations. The method is illustrated with Race's data for 927 unselected British donors, classified with 4 of the rhesus antibodies." It is shown in a Table that the expected phenotype frequency as based on Fisher's method is in extremely close agreement with the observed numbers in the population of 927 donors.—*M. T. Macklin*.

102. Thurstone, L. L. (U. Chicago.) A single plane method of rotation. *Psychometrika* 11(2): 71-80. 1946.—The method of rotation described here is applied to one hyperplane at a time. The method seems to be simple and quite effective and it can be applied by a relatively inexperienced

computer. The method does not postulate a positive manifold and hence it is applicable also to bi-polar factors.—*Courtesy Psychometrika*.

103. Tsao, Fei. (Nat. Centr. U., China.) General solution of the analysis of variance and covariance in the case of unequal or disproportionate numbers of observations in the subclasses. *Psychometrika* 11(2): 107-128. 1946.—In this paper a preview of the problem is given. Then the mathematical solutions of estimating the sums of squares and products of different sources of variation under different assumptions are presented. Two kinds of populations from which our samples are supposed to be drawn are specified. One is defined as possessing approximately the same stratification as our sample; while the other is defined as having equal frequencies in the subclasses. For the 1st kind of population we should use the restrictions of "the weighted means." For the 2d kind, we should use the restrictions of "the unweighted means." The assumption of zero interactions and significant interactions are also considered. After working out the exact method, two approximate methods with appropriate statistical assumptions to be fulfilled are given.—*Courtesy Psychometrika*.

104. Wilcoxon, Frank. (Amer. Cyanamid Co., Stamford, Conn.) Individual comparisons by ranking methods. *Biometrics Bull.* 1(6): 80-83. 1945.—A technique is described for securing rapid approximate tests of significance in comparison of 2 samples equal in size. Observations are ranked after pooling and, for unpaired experiments, the probability of a total sum of ranks equal to or lower than the sum of the lowest sample is determined. For paired expts. the differences are assigned rank numbers neglecting signs and the probability of a sum equal to or less than that of the ranks corresponding to the negative differences is determined. Tables for the probabilities are given.—*J. H. Walkins*.

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also B. A. 20(10): Entries 19226, 19228, 19235, 19250, 19262, 19279, 19429, 2133, 20178, 20628, 21627; and in this issue 410, 991, 992, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1886, 1989, 2185)

### MICROSCOPY AND TECHNIQUE

105. Bennett, A. H., Helen Jupnik, Harold Osterberg, and Oscar W. Richards. (Am. Optical Co., Buffalo 15, N. Y.) Phase microscopy. *Trans. Amer. Microsc. Soc.* 65(2): 99-131. 4 fig. 1946.—Phase microscopy varies the contrast in the image by utilizing absorption and optical path differences placed in the optical path of the microscope. The diffraction integrals which govern image formation in phase microscopy are given. These are solved for a pure phase grating and a purely absorbing grating used as object, subject to the restriction that the grating is illuminated by a plane wave at normal incidence. Some interesting relations between the properties of the diffraction plate and contrast in the image are derived and described. It is possible to reproduce some objects more faithfully by phase than by ordinary microscopy. The general theory is given, and an adequate nomenclature provided for designating the diffraction plates. The Spencer Phase Microscope reveals detail in transparent materials having regions of slightly differing absorption or with different indices of refraction provided the detail is not too small for resolving power of the objective used. By the proper choice of diffraction plate detail in the specimen, otherwise unseen, may be made differentially visible. Colored, transparent materials may be examined and the additional contrast from color filters may be combined with the increased visibility from the use of diffraction plates. The use of absorption in the diffraction plates was found as important as the use of retardation. Bright contrast was found helpful for counting cells, locating materials, seeing pigment formation, and cytoplasmic details in living microscopic organisms. Dark contrast was preferred for determining the shape and measuring size, and for nuclear detail in organisms. Applications considered include: surfaces of glass and plastics, replicas of metal surfaces, fibers, emulsions, homogenized milk and mayonnaise, minerals, bacteriophage, living unstained plant and animal cells and tissues.—*O. W. Richards*.

106. Lillie, R. D. (Nation. Inst. Health, Bethesda, Md.) Effect of metals on Giemsa stain solutions in 50% glycerol and methanol mixture. *Jour. Lab. and Clin. Med.* 31(2): 253-256. 1946.—Thiazine eosinates in glycerol methanol solution are decomposed by various metals electrolytically active. Tin foil and foils containing tin, zinc or cadmium should not be used for bottle cap lining for containers of Giemsa stain.—*L. H. Sophian*.

107. Murdock, S. E. A method for the removal of precipitate from tissues fixed in formaldehyde. *Jour. Tech. Methods and Bull. Internat. Assoc. Med. Mus.* 25: 71-72. 1945.—Other methods used for removal of the pigment have a tendency to make the section come off, but the following procedure where acetone was added to help protect the albumin from the alkali proved satisfactory: Bring sections to water; place in the following: 3% H<sub>2</sub>O<sub>2</sub>, 25 ml.; acetone, 25 ml.; conc. ammonia, 1 drop; let stand in the soln. for 1-2 hrs. or until the ppt. is removed; wash in water; stain as desired.—*Ethel Lieb*.

108. Payne, J. F., and W. Boyd. (U. Toronto, Canada.) Lucite in museum work. *Jour. Tech. Methods and Bull. Internat. Assoc. Med. Mus.* 25: 79-80. 1945.—Lucite is recommended for supporting museum specimens in glass jars or for making the entire jar. It is easy to saw on a band saw and can be readily glued together by a single thin cement made of lucite shavings and chloroform. It is used for plate holders in color photography where metallic ones react with the solns. and spoil the colors.—*Ethel Lieb*.

109. Shyrock, A., and L. M. Ashley. (Coll. Med. Evangelists, Loma Linda, Calif.) Staining racks of 3 designs for coverglass preparations. *Jour. Tech. Methods and Bull. Internat. Assoc. Med. Mus.* 25: 63-66. 1945.—3 racks for staining sections or smears mounted on cover slips are descr. The larger one holds 30 18-mm. cover slips or 60 back to back. Of the 2 smaller ones, the 1st holds 12 singles or 24 doubles, and has a hinged side to keep the slips in place. This rack may be used in small wine reagent glasses which are set in



holes bored in a  $\frac{3}{4}$ -inch board. The other small rack is for 22-mm. squares and holds 9 singles or 18 doubles. The 2 smaller models are recommended for classroom use.—*Ethel Lieb.*

### LABORATORY APPARATUS AND TECHNIQUE

110. Atkins, B. R. (*Brit. Coal Utilization Res. Assoc., London, Eng.*) An apparatus for stirring under vacuum. *Jour. Sci. Instruments* 23(4): 84. 1 fig. 1946.—A modified rotary mercury seal permits the rotating shaft to be introduced into a vessel maintained under vacuum or at pressures up to 2 atm.—*R. L. Weintraub.*
111. Awbery, J. H. (*Nation. Physical Lab., Teddington, Middlesex, Eng.*) Notes on some recent developments in hygrometry. *Jour. Sci. Instruments* 20(10): 153-154. 1943.—Discussion of principles involved in hygrometry and description of some recently developed instruments.—*R. L. Weintraub.*
112. Cares, R. A note on stored formaldehyde and its easy reconditioning. *Jour. Tech. Methods and Bull. Internat. Assoc. Med. Mus.* 25: 67-70. 1945.—Some batches of stock formaldehyde soln. are as low as 25% instead of the expected 37-40%. This loss in strength is due to the formation of polymers of formaldehyde which may be broken down again as follows: the form. is placed in screw top mason jars with rubber gaskets and tightly sealed and autoclaved at 15 lbs. press. for 30 min. Then it is cooled to room temp. before diluting for use. Such reconditioned form. has kept very well. Dilutions should not be made too far in advance because oxidation to formic acid is aided by dissolved  $O_2$  in the water. Marble chips should be used for neutralizing.—*Ethel Lieb.*
113. Clarke, C. D. Rubber moulages for first aid training. *Jour. Tech. Methods and Bull. Internat. Assoc. Med. Mus.* 25: 91-101. 1945.—Detailed instructions are given for making negatives with agar and casting in rubber, wax and plaster.—*Ethel Lieb.*
114. Cooper, Herbert J. (edited by.) *Scientific instruments.* 305p. illus. Chemical Publ. Co., Inc.: New York, 1946.—Brief, elementary descriptions are given of many instruments by 17 contributors and material from 48 British firms is included. Sec. 1 Optical Instruments, covers: lenses, cameras, projectors, light and electron microscope, polarimeters, photometers, range finders, refractometers, interferometers, spectroscopes and telescopes; sec. 2, Measuring Instruments, includes: hygrometers and specific gravity bottles, calipers, micrometers, gages, electrical meters, and devices for measuring pressure, temperature, time, speed and weight. Section 3, Navigation and Surveying Instruments, describes: barometers, barographs, altimeters, gyroscopic instruments, mariner's compass, sextants, sounding equipment and surveying instruments. Sec. 4 on Liquid Testing discusses viscosity measurement. Sec. 5 Miscellaneous, includes: acoustics, calculating machines, hardness indicators, vacuum tubes and thermionic valves. Most of the devices are shown disassembled or illustrated by diagrams. The field of usefulness is indicated, but rarely are operating instructions included. Most of the illustrations are of British instruments.—*O. W. Richards.*
115. Ehrenberg, W., and H. Hirsch. An electronic voltmeter for high voltages. *Jour. Sci. Instruments* 20(10): 161-163. 3 fig. 1943.—A simple new cathode-ray tube is described with which voltages up to about 50 kV. can be measured directly. Its current consumption is very small and the only accessory required is a filament transformer.—*R. L. Weintraub.*
116. Fordham, S., and G. P. Sillitto. (*I. C. I. Ltd., Ardeer, Eng.*) A simple densimeter for solid objects. *Jour. Sci. Instruments* 23(4): 83-84. 2 fig. 1946.—The densimeter, especially suitable for measurements where water displacement methods are inapplicable, is based on the principle of a hydrometer immersed in mercury.—*R. L. Weintraub.*
117. Hall, J. A. (*Nation. Physical Lab., Teddington, Middlesex, Eng.*) An apparatus for use in the selection of barrier-layer photocells. *Jour. Sci. Instruments* 23(3): 59-60. 4 fig. 1946.—Description of apparatus and technique for measuring the fatigue effect (i.e., the gradual decrease of cell current during illumination) of selenium barrier-layer photocells in comparison with a standard cell of the same type.—*R. L. Weintraub.*
118. Hirst, W., and C. G. Cannon. (*Brit. Coal Utilization Res. Assoc., London, Eng.*) A simple temperature control for laboratory electric furnaces. *Jour. Sci. Instruments* 20(8): 129-132. 6 fig. 1943.—A potentiometer bridge and photocell relay unit used with a chromel-alumel thermocouple holds the furnace temperature to  $\pm 1^\circ C$ , and in addition controls the run up to final temp. at any given uniform rate of heating within the limits of performance of the furnace winding. A circuit is described for controlling several furnaces simultaneously with a single photocell unit.—*R. L. Weintraub.*
119. Jack, K. H. An improved laboratory gas scrubber. *Chem. and Indust. [London]* 1946(31): 290. 1946.—A design is descr. which has the advantages that it is robust, easily dismantled for cleaning and refilling, efficient, and readily adjusted for different rates of gas flow. Examples of its applications are the removal of  $O_2$  from  $N_2$  with alkaline pyrogallol and the removal of traces of  $O_2$  from  $H_2$  by means of acid chromous chloride soln. In the latter case the column may be packed with amalgamated Zn. By coupling with a water pump the apparatus is suitable for perfusing a column of solid with liquid, e.g., soil with oxygenated fluid.—*W. M. Holman.*
120. Lovering, P. E., and M. L. Smith. Laboratory electrolyzer constructed from standard Pyrex pipeline units. *Chem. and Indust. [London]* 1946(32): 298. 1946.—A design is descr. for a 3 chamber electrolyzer of about 1 litre capacity. It is prepd. from a standard Pyrex flanged pipeline tee (3 in. size) and 2 standard pipeline reducers. Disc Pt electrodes are supported behind the cellophane membranes, which we clamped at the joints between the glass cells.—*W. M. Holman.*
121. Maggs, F. A. P. A simple electronic relay. *Jour. Sci. Instruments* 23(4): 85-86. 2 fig. 1946.—Circuits are described for switching loads up to several kw.—*R. L. Weintraub.*
122. Morris, A. R. (*Chem. Res. Lab., Teddington, Middlesex, Eng.*) Welding small platinum heaters and electrodes. *Jour. Sci. Instruments* 23(4): 84-85. 3 fig. 1946.—Description of a simple percussion instrument which facilitates hammer welding of platinum ware.—*R. L. Weintraub.*
123. Muirhead, G. S. The leakage of rubber sleeve joints under high vacuum. *Chem. and Indust. [London]* 1946(32): 298. 1946.—The rates of leakage of 20 carefully made rubber joints were tested over the pressure range  $5 \times 10^{-2}$  to 5 min. of Hg. The rate of leakage averaged  $5 \times 10^{-9}$  g. of air/sec./cm. of joint circumference when the joint was made by pushing the sleeve 1 in. over glass tubing of suitable size. If the same joint was then firmly wired the leakage rate was reduced to  $1 \times 10^{-9}$  g./sec./cm. If the same joint was sealed with castor oil or low vapor pressure petroleum distillate as well as being wired, the leakage rate was further reduced to  $4.6 \times 10^{-10}$  g./sec./cm. Other joints not so carefully made gave leakage rates of  $3 \times 10^{-7}$  to  $2 \times 10^{-8}$  g./sec./cm.—*W. M. Holman.*
124. Senior, D. A. A high-power stroboscope. *Jour. Sci. Instruments* 23(4): 81-83. 2 fig. 1946.—A stroboscope is described which is capable of producing flashes of duration  $< 5 \mu sec.$  at speeds around 1000 per sec. for periods of several seconds. Intensity of the flashes is such as to permit photography by reflected light of areas up to 50 sq. ft.—*R. L. Weintraub.*

### PHOTOGRAPHY

125. Beiter, John J. (*Rochester Gen. Hosp., N. Y.*) Blackened shields for clear lamps in medical photography. *Jour. Biol. Photogr. Assoc.* 15(1): 46, 48. 1 fig. 1946.—Better control of high lights is obtained with clear 500 wt. PS-25, 3200 K Mazda lamps. Shiny reflectors were blackened with a matte finish baking enamel to limit the light and obtain the advantage of the clear lamp. A home-made reflector from a No. 10 can was found useful.—*O. W. Richards.*
126. Collings, Charles W. (*Danville, Ill.*) Wild flower photography. *Jour. Biol. Photogr. Assoc.* 15(1): 23-29. 11 fig. 1946.—Instructions are given for photographing flowers in nature and for constructing a suitable habitat table for indoor pictures.—*O. W. Richards.*
127. Dittmann, Stephan P. (*Army Med. Mus., Washington, D. C.*) Medical photography in the Army. *Jour. Biol.*



*Photogr. Assoc.* 15(1): 19-22. 1946.—The advance of medical photography during the war is summarized briefly. For still pictures the 4 × 5 Speed Graphic was fundamental. Black and white and color were used, also infrared. Motion picture, stereoscopic, intraoral, cineradiography and miniature photography were important.—O. W. Richards.

128. Enns, T. (*Biochem. Res. Found., Newark, Del.*) A microdensitometer for quantitative determination of relative densities of photographic negatives of tissue cells. *Jour. Franklin Inst.* 242(2): 151-153. 2 fig. 1946.—A photoelectric densitometer designed to measure the light delivered by one eyepiece of a binocular microscope permits the objective measurement of small areas on photomicrographic negatives. When such images are produced by monochromatic light, the image density is inversely related to the light absorbed by the corresponding tissue area. The free eyepiece permits the focussing of a background area so that the diaphragm of the microscope may be adjusted to give a reading of ten, thus eliminating variations in overall negative density. The desired area may then be measured for direct comparison with similar areas in other negatives. In addition to measuring relative absorption of structures such as cell nuclei, the instrument may be used to read spectrographic plates. The instrument consists essentially of a photoelectric cell, an electronic current amplifier and a potentiometer. All parts are mounted in a brass case, providing electrical shielding and excluding extraneous light.—R. K. Jennings.

129. Eyles, E. D. (*Res. Lab., Kodak Ltd., Wealdstone, Harrow, Middlesex, Eng.*) Simple time base for a high-speed cine camera. *Jour. Sci. Instruments* 20(7): 114-115. 1 fig. 1943.—The time base consists of an electrically maintained 1000 cyc./sec. tuning fork carrying slit apertures in overlapping plates at the ends of the prongs. Light from a small tungsten filament lamp is concentrated on the slits and an image of them is focussed on the film. As the fork vibrates the slits are displaced relative to each other, and the light beam is interrupted to produce a time base divided into 0.001 sec. intervals in the form of a series of dashes photographed along the edge of the film.—R. L. Weintraub.

130. Flesch, Stanley J. (230 S. Wabash Ave., Chicago.) A new, improved instrument for color photography. Its use in the associated medical sciences. *Jour. Biol. Photogr. Assoc.* 15(1): 13-18. 2 fig. 1946.—The Harrison Light Corrector Meter consists of 22 color filters mounted on a revolving disc in a viewing holder for use in estimating the color temperature of lighting for color photography. Cor-

recting filters are indicated for changing the color temp. to that required by the film used. A brief description of color temp. and the use of the meter is given.—O. W. Richards.

131. LaRue, Mervin W., and J. D. Brubaker. (159 E. Chicago Ave., Ill.) Ear-drum and macro cinematography in Kodachrome. *Jour. Biol. Photogr. Assoc.* 15(1): 3-12. 3 fig. 1946.—Detailed description of the camera and viewing equipment, light source and technic for making pictures of the ear drum and other small objects at a ratio of 1:1 or less is given. About 650 candles per square foot are obtained by overvoltageing a 6-v. ribbon filament lamp, which is adequate for Kodachrome. A heat-absorbing filter is necessary. Owing to the position of the ear drum a considerable depth of focus had to be attained. The equipment is preset and the electrical control equipment is illustrated.—O. W. Richards.

132. Sadler, Albert. (*Wayne Co. Gen. Hosp., Eloise, Mich.*) Amplifying lenses for biological photomicrography. *Jour. Biol. Photogr. Assoc.* 15(1): 31-45. 1946.—Tests were made with negative amplifying oculars and compensating oculars for critical comparison. The definition was found equal to that of a compensating ocular up to 1000 times the N.A. of the objective. The diam. of the field was small and of the image likewise unless the camera bellows was large. The field was flatter with the amplifiers. Computation of magnification was found difficult. Compensating oculars produced critical definition at 2000 times the N.A. of the apochromatic objectives. Sadler concludes that the amplifying oculars are not worth their higher cost and recommends instead compensating oculars.—O. W. Richards.

133. Stevens, G. W. W. (*Res. Lab., Kodak Ltd., Wealdstone, Harrow, Middlesex, Eng.*) The removal of an unwanted image layer from one side of double-coated X-ray film negatives. *Jour. Sci. Instruments* 20(8): 133-134. 1 fig. 1943.—Technique is described for removing the emulsion with a soln. of Na hypochlorite (10% wt./vol. available Cl).—R. L. Weintraub.

134. Wheeler, L. J. (*Res. Lab., Kodak Ltd., Wealdstone, Harrow, Middlesex, Eng.*) Perspective drawing made easy by photography. *Jour. Sci. Instruments* 20(7): 115-116. 2 fig. 1943.—Two methods are described: (1) A photograph of the object is made from the required angle and the main outlines of the object traced from it. (2) The lines desired in the final drawing are inked directly on the photograph and the remainder bleached away in a soln. of HNO<sub>3</sub> and thiocarbamide.—R. L. Weintraub.

## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Entries New periodical, 28; New Rh allele, 97; Spider superstitions and Folklore, 2343)

135. Comas, Juan. Contribution à l'étude du métisme. [Contribution to the study of metopism.] *Arch. Suisses Anthropol. Gén.* 10: 144p. 1942.
136. Duparc, Germaine. Contribution à l'étude anthropologique de la colonne vertébrale. Enquête portant sur 66 rachis de Boschimans, Hottentots et Griquas. [Contribution to the anthropological study of the vertebral column. Investigation of 66 spines of Bushmen, Hottentots and Griquas.] *Arch. Suisses Anthropol. Gén.* 10(1/2): 138p. 1942.
137. Farinaud, E. (*Inst. Pasteur de Saigon, Indo-China*.) Contribution à l'étude des populations de l'Indo-Chine méridionale française d'après la répartition des groupes sanguins. *Bull. Soc. Anthropol. Paris* 2(9): 75-102. 2 fig. 1941.—Blood grouping expts. on natives of French Indo-China yielded the following distr. according to the Ottenburg schema:  $O > A > B$ , Type II (intermediate): Djaras ( $N = 1017$ ) 1.55; Dies ( $N = 136$ ) 1.24; Sedangs ( $N = 647$ ) 1.16.  $O > B > A$ , Type III (africo-south asiatic): Rhades ( $N = 853$ ) 0.92; Banhars ( $N = 1069$ ) 0.97; Khoos ( $N = 300$ ) 0.85; Sooci ( $N = 150$ ) 0.82; Chams ( $N = 794$ ) 0.76; Annamites ( $N = 1261$ ) 0.75.  $B > O > A$ , Type IV (Hindu-Manchu): Cambodians ( $N = 791$ ) 0.66; Laotians (north) ( $N = 337$ ) 0.58; Laotians (south) ( $N = 505$ ) 0.68; Porrs ( $N = 245$ ) 0.40.  $B > A > O$  (Indonesian type): Mnongs-Rlam ( $N = 1095$ ) 0.99; Phnongs ( $N = 599$ ) 0.90; Khas ( $N = 690$ ) 0.91; Stiengs ( $N = 508$ ) 0.87. It is probable that the last group represents an enclave that has preserved intact the type of the first invaders. This coincides with ethnographic opinion that places the cradle of the Indonesian race in Indo-China, and makes the Mnongs and Phnongs its representatives there. The affinities of the people of Indo-China with those of the surrounding areas are tentatively indicated by the blood group study, and tie in with Przyluski's 3 stages of the peopling of the country, viz., a Negrito-Melanesian type at the beginning of the Neolithic, an Indonesian type during the Neolithic, and, during the Metal period, increasing increments of Mongoloid and Siamese or Hindu elements. The Cambodians show Hindu and Mongoloid influences; the Indonesian type peoples have resemblances with the Tatars of Crimea and with the Ainus, suggesting that they ultimately derive from a great central Asiatic reservoir; the majority of the people of the High Plateau of Indo-China and the Annamites (as well as people of Java and Sumatra) are intermediate between the Indonesians and the Melaneso-Polynesians; the Chams, often considered the prototype of Malayo-Polynesian races, received the principal elements of their civilization from Dravidian India; the Annamites of Tonkin are obviously related to the Chams, but also show relationship with the Cantonese, whereas the Annamites uninfluenced by Chams or Cantonese resemble the Bahars and the Mnongs of the mountains; the Rhades may be considered a mixture of Phnongs and Chams; all these peoples may be united in a group called Meta- or Para-Indonesian. The Chams are linked directly with the Malayo-Polynesian races; the Sedangs, Djaras and Dies are remnants of an ancient ethnic element, since especially the Sedangs and Dies are close to the Negritos or Micronesians, while the Djaras are more closely related to the Melanesians. The races of nearby lands may be divided into 2 groups:  $A > B$  (Negritos, Micronesians, Australians, and preponderantly, Melanesians and Polynesians); and  $B > A$  (Hindus, Australo-Polynesians and Papuans): a gradual reversal of dominance from west to east. The % of Group O show highest values for the peripheries, and the inhabitants of Nias and Batoe are the most primitive in this respect. Relationships indicated by incidence of Group O indicate close relationship between the west coast of Sumatra, some Papuans, and Australian aborigines. These possibly represent remnants of the earliest population.—J. F. Ewing.
138. Gan, J.-K. (*École pratique des Hautes-Études, Paris*.) Contribution à l'étude des dents chez les anthropoïdes. I. Un cas d'hypoplasie de l'émail sur la canine supérieure gauche d'un chimpanzé (*Pan satyrus verus* Schwarz [?]). *Bull. Soc. Anthropol. Paris* 2(9): 16-19. 2 fig. 1941.—To the author's knowledge, this is the first observation of hypoplasia of the enamel of the teeth ever published concerning an anthropoid. The specimen is a young adult chimpanzee from the Ivory Coast. The anomaly is found on the upper left canine. It is in the form of an erosion line around the tooth, which demarcates a very small tip-region from a much larger region nearer the cingulum. The best theory concerning the cause of this phenomenon (which has also been reported of mammals, such as the horse, the elephant, the hippopotamus, oxen, and the dog, as well as of Krapina and Neolithic man) is that of a hindrance of development by an infectious disease during infancy.—J. F. Ewing.
139. Manuila, Alexandre. (*U. Geneva, Switzerland*.) Contributions aux études sero-anthropologique. I. Quel est le nombre nécessaire et suffisant d'examen dans les recherches biologiques? *Arch. Suisses Anthropol. Gén. Suppl.* 11(2): 1-46. 1945.—A comprehensive monograph by the Roumanian scientist who has published many articles on biological statistics. If 2,300 determinations are made the error may be  $< 3.89\%$ . If the number is 500-1500, the error may be  $< 4\%$ . When the number is  $< 500$  the error increases. The number sought ("nécessaire et suffisant") is  $1/10,000 = 0.9999$ , i.e., in 10,000 determinations the figures are good in 9,999 instances, the error does not exceed that indicated in 1 single case. Numerous mathematical calculations, statistical tables and graphs explain how these conclusions are derived.
140. Nicholson, C., and H. S. Allen. Variation in the female pelvis. *Lancet* 250: 192-195. 3 fig. 1946.—The authors radiologically measured the pelves in 307 primigravidae and correlated the results with the course of labour at term. All were delivered as vertex presentations. They were mainly concerned with the android type of pelvis described by Caldwell and Moloy and they give statistical evidence that this type of pelvis is associated neither with contraction of the pelvic angle nor with difficulty in labour. They consider that the main help that can be given by the radiologist to the obstetrician is in accurately determining the pubic angle and the area of the pelvic brim. These would appear to be much more important in determining the possible difficulty of labour.—H. B. Stoner.
141. Pittard, Eugène. (*U. Geneva, Switzerland*.) A propos de la trépanation préhistorique. *Arch. Suisses Anthropol. Gén.* 11(1): 56-67. 1 fig. 1945.—Two phases of prehistoric trepanation are discussed. Some investigators believe that the so-called trephining of ancient skulls was due to pathological conditions (syphilis, tuberculosis, malignant tumors), not to surgical operation; others think that voluntary surgical trepanation never occurred in the neolithic age but belongs to a later period. Pittard presents evidence that certain of the Neolithics practised surgical trepanation, and even several times on the same individual. A healed surgical trepanation can be clearly differentiated from a pathological "trepanation" by its form, the aspect of its edges and the presence of scar enamel.
142. Rode, P. (*Mus. Nation. Hist. Nat., Paris, France*.) Note sur un crâne de chimpanzé. *Bull. Soc. Anthropol. Paris* 2(9): 13-15. 1 fig. 1941.—A large (138 m. overall length) chimpanzee, of the sub-species *Pan satyrus verus* yielded a massive skull, which is notable for great development of supraorbital ridges. These exceeded the dimensions and frontal projection found in any hitherto described chimpanzee. The fact that 2 infant chimps fathered by this ♂ showed no extraordinary development of the ridges indicates that the development in this ♂ was an individual variation.—J. F. Ewing.
143. Senyürek, Muzaffer Süleyman. (*U. Ankara, Turkey*.) The multiplicity of foramina mentalia in a human mandible from the copper age of Anatolia. *Nature [London]* 157: 792. 1946.—A mandible of *Homo sapiens* about 4000 years old from the copper period of Kusura was found to have 4 mental foramina on the left side and 5 on the right side, the latter located in a well-defined depressed area of

oval shape. The anatomy of the foramina is described. The conclusion from comparative data is drawn that the multiplicity of mental foramina is a primitive feature for the hominids, and during evolution the number tends to reduction until in recent man generally only one occurs.—*Simon Sevit.*

144. Snow, Charles E. The skeletal remains from the Robbins mound. In: *The Robbins mounds, sites Be 3 and Be 14, Boone Co., Ky., by Wm. S. Webb and John B. Elliott. Univ. Kentucky Publ. Anthropol. and Archaeol.* 5(5): 376-499. 1942. Pr. 50¢.—63 ♂♂, 26 ♀♀, and 11 indet. skeletons, ranging from infancy to old age, were found in Robbins mound, Be 3. 51 ♂♂ and 15 ♀♀ represented young and middle age adults. Preservation, in general, was poor; only 10 ♂♂ and 5 ♀♀ crania, and 10 ♂♂ and 6 ♀♀ infra-cranial skeletons could be measured. Cranial and infra-cranial skeleton are described both metrically and morphoscopically. Occipital deformation, usually vertical, characterizes 28 of the 36 crania on which such observations are possible. Morphologically, these crania conform to Neumann's Centralid (Hrdlička's Gulf) type. For the ♂ crania, mean glabello-occipital length is 164.6 mm.; max. breadth, 146.5 mm.; basion-bregma ht., 150.5 mm.; cranial index, 88.7; length-height index, 90; total facial ht., 123.1 mm.; upper facial ht., 72.5 mm.; bi-zygomatic breadth, 141.8 mm.; nasal ht., 52.7 mm.; nasal breadth, 24.9 mm.; breadth of R. orbit, 43.8 mm.; ht. of R. orbit, 33.8 mm.; total facial index, 87.9; upper facial index, 51.7; nasal index, 48.7; R. orbital index, 76.7. The ♀ crania average 159.5 mm. in glabello-occipital length; 148.1 mm. in max. breadth; 148.0 mm. in basion-bregma ht.; 92.6 in cranial index; 93.6 in length-height index; 117.0 mm. in total facial ht.; 71.0 mm. in upper facial ht.; 123.0 mm. in bi-zygomatic breadth; 51.7 mm. in nasal ht.; 23.9 mm. in nasal breadth; 40.0 mm. in breadth of R. orbit; 36.2 mm. in ht. of R. orbit; 100.0 in total facial index, one specimen; 58.6 in upper facial index; 45.0 in nasal index; 87.5 in R. orbital index. Metrically, these crania approximate closely the means for crania from other Adena sites—Ricketts, Wright, and the Morgan stone and Paintsville mounds. Est. stature for 6 ♂♂ is 1680 mm. (66.2"); for one ♀, 1547 mm. (60.8"). Pathological lesions comprise: arthritis, osteoporosis symmetrica, osteitis or periosteitis, dental caries and dental abscesses.—*R. M. Snodgrass.*

145. Vallois, H. V. (*École pratique des Hautes-Études, Paris.*) Recherches anthropologiques sur les Peuls et divers noirs de l'Afrique Occidentale. *Bull. Soc. Anthropol. Paris* 2(9): 20-74. 3 fig. 1941.—A total of 155 ♂ Negroes from Senegal, Gambia, and French Guinea, measured by M. Léca in 1932, were studied. These broke down into 28 Peuls (Fula), 51 Wolofs, and 76 from the Mandyago, Diola, Kissi, Toma, Guerze and Manon. With the help of previous literature, 3 types were isolated. The Peul type shows a varying amount of primitive White influence. The Peuls,

however, are not intermediate between Negro and White, and hybridization has taken a diff. course in this case than among the Ethiopians. The Wolof type is very close to the Peul type. The Wolofs have been considered the typical Negro, but they have only moderate prognathism, moderate flattening of the nose, and the arm is not excessively long. The "typical Negro" is a series of types. The 3d type, the Guinean, is very different from the Peul and Wolof taken together. The Guineans, along with flatter noses, everted lips and woolly hair, have a lighter skin color than even the Wolofs, more beard, while prognathism is almost absent. The Guineans are definitely not the Palaeo-tropical type of Montandon or the Palaeo-negrid of Eickstedt. Avs. of important metric data (1st figure: Wolof-Peuls; 2d figure: Guineans): Stature: 170-3, 166-9; Shoulder-Hip Index: 67-70, 65-6; CI: 73-4, 73-5; Cephalo-Facial Index: 94-5, 96-8; Facial Index: 81-3, 80-2; UFI: 46-7, 44-6; NI: 92-3, 100-105. Body build of all groups, predom. linear; skin color (roughly est.) especially black among the Wolofs, black with red especially among the Peul and many Guineans; body hair of all, sub-submedium; head hair of all, thick, woolly (the degree of spiral varies much); beard and mustache, sub-submedium or absent; eye color, black not over 50% for the Guineans, 28.5% for the Peul, others varying shades of brown; nose projecting among the Wolof and the Peul, flattened among the Guineans; prognathism (alveolar), in ascending order: Guineans, Wolof, Peul.—*J. F. Ewing.*

146. Wallis, W. D., and R. S. Wallis. (*U. Minnesota, Minneapolis.*) Sex differences in cephalic index during growth. *Southwestern Jour. Anthropol.* 2(1): 56-83. 4 fig. 1946.—The authors use almost 90 groups of fetal-preschool, 6-18 years, and adult age to show that there is no predictable trend for sex diffs. in CI during growth and that sex diffs. are uncertain in adulthood. Of 108 adult groups the ♀♀ were rounder-headed in only 53%. CI rises until the age of 6-9 mos., then decreases (in ♂♂ by 2.5 units up to 18 yrs.) until 30-40 yrs., then rises until a marked old age decrease. Age change is greater and steadier in ♂♂ than in ♀♀ and in short-headed compared to long-headed samples. ♀♀ av. longer-headed than ♂♂ from fetal life up to 14 yrs., after which ♂♂ tend to be longer-headed. The adult sex diff. is greater among extreme dolichocephals and especially among brachycephals than in the intermediate groups. The only consistent sex diff. is that with length held constant ♀♀ have narrower heads than ♂♂ at all ages. This may show the "advanced" character of ♂ headform but fails to show an "infantile" tendency among ♀♀. Seriation by units of length emphasizes the increase in sex diff. with increasing short-headedness, and the more pronounced ♂ than ♀ CI contrasts between diff. racial groups.—*J. L. Angel.*

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Reactions of flies to changes in atmospheric pressure, 162; Swimming behavior of salamanders after excision of brain parts, 978; Mating behavior domestic fowl, 1090; Locomotion in Protozoa, 2236; Response to gravity Hydra, 2280; Change of form in *Pelmatohydra*, 2282, 2283; Commensalism, diptera—ant, 2391; Social behavior of collared lizard, 2435; Dance of Lesser Bustard, 2463)

147. Breder, Charles M. Jr. (*Amer. Mus. Nat. Hist., N. Y. C.*), and Florence Halpern. (*New York U.*) Innate and acquired behavior affecting the aggregation of fishes. *Physiol. Zool.* 19(2): 154-190. 4 fig. 1946.—Fright induced by a wide variety of visual, mechanical and chemical stimuli induce the formation of temporary schools in *Brachydanio rerio*, but any one stimulus soon loses its potency. Attempts at training *Brachydanio* to aggregational behavior by a punishment technique led to fighting instead of schooling. Individuals of *Brachydanio* reared from the egg in isolation joined an aggregation at once, but individuals removed from a group to isolation and subsequently returned showed considerable hesitancy. Moving targets of any shape were moved toward, up to a certain size, beyond which they were retreated from, followed by a gathering at the point where last seen. Any such stimulus soon lost its potency. On being given a choice of background between yellow and

gray, *Carassius* of either matching color avoided the yellow, although in the case of the yellow fish, they became very conspicuous. Groups of *Carassius* of like-colored phenotypes were more cohesive than groups in which one fish was of an odd color, on either matching or contrasting backgrounds, as measured by their aggregation pattern. Isolation of *Carassius* for a period of 6 months modified the normal aggregating behavior pattern and the fish appeared unusually sensitive to stimuli formerly ineffective. Phenotypically uniform groups of *Carassius* closely approximated the distribution indicated by the reciprocal of binomial distribution as contrasted with blind specimens which approached binomial distribution. Mixed groups of blind and seeing *Carassius* approximated the reciprocal of the mean of binomial distribution and its reciprocal. Mixed groups of differing phenotypes of *Carassius* and groups of previously isolated *Carassius* and *Brachydanio* did not approach any



evident simple mathematical expression. The implications inherent in the above results are discussed in reference to other items in fish aggregations and schools and speculations bearing thereon.—C. M. Breder, Jr.

148. Calhoun, John B. (Ohio State U., Columbus.) Twenty-four hour periodicities in the animal kingdom. II. The vertebrates. *Jour. Tennessee Acad. Sci.* 20(2): 228-232; (3): 291-308; (4): 373-378. 1945; 21(2): 208-216; (3): 281-282. 1946.—In this review are assembled quantitative data pertaining to 24-hr. periodic activities with particular emphasis upon locomotor activities. The data are presented in a phylogenetic order. The principal generalizations which may be made concerning the initiation, occurrence, maintenance, and modification of activity and metabolic rhythms in relation to the diel (24-hr.) period are: (1) Most animals, when subjected to a diel variation of meteorological conditions (particularly light and temp.), tend to have their activities more pronounced in either the day or the night period. (2) Animals such as the cave-crayfish, moles, and shrews are arrhythmic, apparently because they inhabit an environment where temp. and light changes, if any, are negligible; some ants are arrhythmic and human populations are tending to become arrhythmic as sociality superimposes a relatively stable environment upon them. (3) Endogenous diel rhythms occur in members of the following groups: Coelenterata, Platyhelminthes, Echinodermata, Crustacea, Insecta, Cyclostomata, Pisces, Amphibia, Reptilia, Aves, and Mammalia. (4) The major period of activity of many nocturnal animals occurs during the first half of the night period. Among the animals so characterized are: Coelenterata: *Aurelia*; Nematelminthes: *Wuchereria bancrofti*; Annelida: *Lumbricus*; Mollusca: *Ostrea*; Arthropoda: *Cambarus virilis*, *Potamobius astacus*, *Jassidae*, *Tomasopsis sucharina*, *Blatta orientalis*, *Gryllus domesticus*, *G. assimilis*, *Chilo simplex*, *Megalodacne heros*, *Tipulinae*; Pisces: *Ambloplites rupestris*; Amphibia: *Bufo americanus*, *B. fowleri*; Mammalia: *Erinaceus europaeus*, *E. roumanicus*, *Neotoma albigula*, *Peromyscus leucopus*, *Mus wagneri*, *M. musculus*, *Rattus norvegicus*, *Macacus rhesus*. (5) The major period of activity of many diurnal animals occurs during the first half of the day period. Among the animals so characterized are: *Calliphora erythrocephala*, *Tamias griseus*, *Cnemidophorus sexlineatus*, *Chrysemys picta*, and *Citellus tridecemlineatus*. (6) Most nocturnal animals which possess a pre-midnight major period of activity also possess a secondary pre-dawn period of activity. Similarly most diurnal animals with a pre-noon major period of activity also possess a secondary pre-dusk period of activity. (7) The data from (4) and (5) suggest that competition in an animal community must be much more severe during the first half of the day period and during the first half of the night period. (8) Continuous light stimulation usually inhibits activity in nocturnal animals: (a) by decreasing the total amt. of activity, (b) by inhibiting the inception of the major peak of activity so that it occurs at a later hour each day, or (c) by the rather immediate destruction of the usual diel pattern and its replacement by an arrhythmic pattern of activity. Continuous darkness has similar effects upon some diurnal animals. (9) The continued absence of light stimulation among nocturnal animals tends to increase activity and frequently causes the peak of activity to fall at an earlier time each day. Continuous light stimulation among diurnal animals has similar effects. (10) Most animals which have been studied while they are young are arrhythmic. (11) Among mammals a completely functional cerebral cortex seems to be necessary for the maintenance of a diel activity pattern. Decorticated cats, dogs, monkeys, and human idiots as well, are completely arrhythmic in regard to the 24-hr. cycle.—J. B. Calhoun.

149. Folger, H. T. (Fish U., Nashville, Tenn.) The reactions of *Culex* larvae and pupae to gravity, light, and mechanical shock. *Physiol. Zool.* 19(2): 190-202. 1946.—Mosquito larvae and pupae react to a change in light intensity or to a mechanical shock by dropping from the surface of the water. Two kinds of stimuli are combined to bring about the descent, one of them being kinetic and causing activity, and the other being directive and determining direction of movement. A kinetic stimulus is associated with time-rate of change of the stimulating agent, a directive stimulus with sustained action. Mechanical shock is kinetic; gravity is

directive; light is both kinetic and directive. • Larvae are either negative to gravity and positive to light or indifferent to these stimulating agents when at the surface. Mechanical shock or change in light intensity makes them positive to gravity and negative to light, and they descend. Soon there is a reversal of the reactions to these stimuli, and the animals return to the surface. Larvae react to a decrease in light intensity, less strongly if the light is below them than if it is above. They react less strongly to an increase of light from above, not at all with light below. The lesser efficiency of the light when it is below suggests that the effective rays are those which enter the eye from above. If so, with a light beneath the larvae, the effective rays are those that are reflected down from the surface.—H. T. Folger.

150. Griffin, D. R. (Harvard U., Cambridge, Mass.) Supersonic cries of bats. *Nature [London]* 158: 46. 1946.—Special instruments were devised to study high frequency sounds, consisting of a condenser microphone with a cathode follower stage and several stages of voltage amplification. The sound ("echo-location") waves emitted by the bat were then reproduced on the face of a cathode ray oscillograph and investigations of the supersonic pulse, the faintly audible click, and audible buzz were carried out. Griffin argues that although the supersonic pulse of 50 Kc. is inaudible to man, its abrupt starting and stopping might stimulate human ears and become the audible click. The buzz is merely a rapid click repetition at rates up to 60 per sec. Photographic results of the pulses used by *Myotis l. lucifugus* to echolocate obstacles are shown. The photographs show no trace of low frequency waves; the pulses are of a very short duration, 1 to 2 millisees., which would permit a bat to echolocate objects as close as 1 ft. At no time did the pulse duration vary with the rate of emission as suggested by Hartridge, but there was a progressive drop in frequency throughout an individual pulse, e.g., from 80 Kc. at the beginning to 50 Kc. at the end. However, the pulse never drops into the frequency range of the human ear. The author plugged the nostrils of bats and found that they continued to make supersonic cries and avoid obstacles. He therefore argues that the pulses cannot be issued through the nose as Hartridge suggests, but are issued through the mouth.—Simon Seville.

151. Lindesmith, A. R. (Indiana U., Bloomington.) Can chimpanzees become morphine addicts? *Jour. Comp. Psychol.* 39(1): 109-117. 1946.—The monograph of S. D. S. Spragg on the above topic is criticized on 3 grounds: (1) Spragg did not compare his chimpanzee subjects with human addicts; had he done so he would have been led to different conclusions. (2) His definition of addiction is inadequate and is simply a description of the behavior of his chimpanzees. (3) He is anthropomorphic in implying that the chimpanzees desire morphine. It is acknowledged that these primates become "habituated." However, the critic remains convinced that lower animals, lacking language, cannot become "addicted" to a drug.—R. F. Jarrett.

152. Reed, Charles A., and Racheal Reed. The copulatory behavior of the golden hamster. *Jour. Comp. Psychol.* 39(1): 7-12. 1946.—♂ and ♀ hamsters are more interested in each other than in the strange test area in which they are placed. The testes descend immediately after the ♂ meets the ♀. If the ♀ is receptive she requires but little stimulation before assuming the copulatory attitude, which under typical circumstances may be maintained for minutes at a time. "Copulations may continue for more than half an hour, during most of which the ♀ remains rigidly in the copulatory position." On the part of the ♂ the copulatory act comprises two phases; (1) several rapid piston-like thrusts terminating in "successful" copulations, in (2) a spasmodic thrust during which "the pelvic region is held rigidly forward against the ♀ for a few seconds, while the clasping forearms tighten deeply into the female's flank." Several "successful" copulations in succession precede emission. Between successive acts of copulation the ♂ attends to his genitals, while the ♀ maintains the copulatory posture.—R. F. Jarrett.

153. Smith, Karl U. (U. Wisconsin, Madison), and Robert S. Daniel. (U. Missouri, Columbia.) Observations of behavioral development in the loggerhead turtle (*Caretta caretta*). *Science* 104(2694): 154-156. 2 fig. 1946.—



The behavioral development of the loggerhead turtle in the egg involves, first, an initial mass-type C-movement, next, appearance of local responses integrated with this pattern, and finally, elaboration of behavioral patterns subsequently adjustive in the terrestrial and aquatic environment. The presence of C-movement is significant since it emphasizes the role of mass movement in the development of response. It is concluded that behavioral maturation and integration are not related to embryonic practice or repetition, but are an outcome of physiol. differentiation and specialization of the more general movements in the maturation process. Specific local movements and adaptive coordinations of re-

sponse thus are regarded as ontogenetically organized with reference to generalized patterns of behavior which constitute a matrix for subsequent behavior development.—*H. M. Kaplan.*

154. Wells, F. L. Behavior notes on *E. insularis* Hentz: Domestication, involution. *Jour. Genet. Psychol.* 68: 159-164. 1946.—A brief report on the behavior of a spider living in the author's house for several months, with notes on comparable behavior of other species. Water was not needed except as contained in natural food. Killed prey often was not approached except in the presence of special tuning-fork stimulation.—*R. B. Ammons.*

# ECOLOGY

## Editors

ORLANDO PARK, *General Animal Ecology*

G. D. FULLER, *General Plant Ecology*

G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

FREDERICK A. DAVIDSON, *Ecology of Wildlife Management—Aquatic*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL and ANIMAL ECOLOGY]—Daily activity rhythms, 148; Reactions of flies to changes in atmospheric pressure, 162; Population studies, trout, 238; Railroads and the dispersal of mosquitoes, 2226; Substrate as affecting metamorphosis in Annelida, 2289; Mollusca of Panama, 2315; Evolution of cave isopods, 2325; Temp. effect on coleoptera, 2356; Commensalism, diptera—ant, 2391; Metamorphosis in Odonata, 2406; Pacific eels, 2420; Mammal fauna of Baltic Islands, 2481. [PLANT ECOLOGY]—Range rodents and plant succession, 263; Cyperaceae in Denmark, 1650; Crassulaceae and Saxifragaceae in Denmark, 1655; Vegetation of Sinaloa (Mexico), 1678; Comparison of soil-conserving grasses, 1706; Radial growth of trees at different altitudes, 1822; Forest vegetation of Portugal, 1832; pH, CO<sub>2</sub> conc. and growth of aquatic plants, 1889)

## GENERAL

155. Elton, Charles. (*Oxford U., Eng.*) Competition and the structure of ecological communities. *Jour. Animal Ecol.* 15(1): 54-68. 1 fig. 1946.—Analysis was made of the published ecological surveys of 55 animal (including some parasites) communities and 27 plant communities from a wide range of habitats, and the frequencies of genera with different numbers of spp. tabulated. A rather constant and high % of genera with only 1 species present was found, the average being 86% for animal and 84% for plant communities. The corresponding av. numbers of spp. per genus were 1.38 and 1.22. These figures differ considerably from those of a faunal list for any large region, e.g., the % of genera with only 1 sp. present for 11 large British insect groups is 50, and the av. number of spp. per genus for all British insects is 4.23. The difference in species/genus frequencies between ecological surveys of relatively small parts of any general habitat, and those for faunal lists from larger regions, is attributed to existing or historical effects of competition between spp. of the same genus, resulting in a strong tendency for the spp. of any genus to be distributed as ecotypes in different habitats, or if not, to be unable to coexist permanently on the same area of the same habitat. These conclusions apply at present only to the list of communities hitherto surveyed with any completeness, which does not include a sufficient sample of terrestrial habitats like heath, meadow, scrub and woodland containing many plant spp. The animal communities analyzed are mostly ones in which the primary consumer species depend on only a few natural resources. The ability of certain groups of spp., mostly separated by generic characters, to exist together on the same area while drawing upon a common pool of resources, is one of the central unsolved problems in animal community structure and population dynamics.—*Auth. summ.*

156. Larrison, Earl J. Biotic areas in the Pacific Northwest. *Murrelet* 27(2): 19-24. 1946.—A review of distributional generalities, applied to the Central Cascade region of Washington.—*J. W. Skipp.*

157. Lindberg, Harald. Märkliga växt- och skalbaggsfynd belysande Finlands utvecklingshistoria. [Remarkable plant and coleoptera finds, illustrating Finland's developmental history.] *Memorand. Soc. Fauna et Flora Fennica* 18: 56-61. 1941.—An account is given of the occurrence and distr. of *Potamogeton vaginatus*, *P. pectinatus*, *Puccinellia phryganodes*, *Ranunculus salsuginosus* and of the following Coleoptera: *Phyllotreta zimmermanni*, *Haemonia pubipennis*, *Amara majuscula*, *A. creneola* and *Gronops inaequalis*. The author believes that these spp. have survived since the Ancyclus Age, and that some part of Finland, during the Ancyclus Age, had a fauna and flora which, to some extent at least, corresponded to those of eastern Siberia, Baikal and Mongolia.—*W. Rosén.*

## BIOTIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Light as ecol. factor, 181; Importance of weather data in wildlife management, 272; Erythemat threshold for sunburn, 345; Protective measures against sunburn, 346; Tissue damage due to cold, 351; Temperature effects on blood flow and deep temp. of human forearm, 429; on coleoptera, 2356; Tolerance of man to cold as affected by diet, 556, 557,

558; The air of stables, 1578; Weather as affecting vit. C in strawberries, 1769; Vegetable growing in western Europe, 1785)

158. Bertrand, Gabriel. Sur le magnésium contenu dans l'eau de pluie récoltée à Grignon. *Ann. Inst. Pasteur [Paris]* 69(9/10): 294-302. 1943.—The composition of rainwater was investigated at Grignon (30 km. from Paris). Analytical procedures and results are given in detail. The influence of dust and of the glass used is evaluated, and it is shown that rainwater at Grignon contains some magnesia, that is not attributable to these sources.—*Jan Smit.*

159. Bertrand, Gabriel. Sur le magnésium contenu dans l'eau de pluie récoltée à Paris. [On the amt. of Mg present in rain water collected in Paris.] *Ann. Inst. Pasteur [Paris]* 70(7/8): 234-247. 1944.—In Paris, as in Grignon (*Ibid.* 69: 294. 1943), rainwater contains small amts. of dissolved substances, especially Mg. A relatively important fraction of these substances does not originate from dust. The amt. of solutes is least between June and Sept.—*Jan Smit.*

160. Pengra, Ray F. (*South Dakota State Coll., Brookings.*) Correlation analysis of precipitation and crop yield data for the sub-humid areas of the Northern Great Plains. *Jour. Amer. Soc. Agron.* 38(9): 848-850. 1946.—The objective of the study was to determine the relative contribution to crop production of precipitation received in the pre-seasonal and seasonal periods of the crop year and to investigate the possibility of developing a forecasting formula which, at planting time, would give a reasonable indication of the yield that might be expected the following season. Data for 8 counties were subdivided into areas of uniform precipitation and soil types. The study covered the years 1919-1943. Grains studied were corn, wheat, oats and barley. Correlation and regression coeffs. for yield and precipitation are shown. Estimating equations for S. Dakota were tested on Nebraska and N. Dakota data with favorable results.—*R. F. Pengra.*

161. Ramdas, L. A. (*Meteorol. Office, Poona, India.*) Climatic factors in agriculture. *Indian Farming* 3(5): 273-276. 1942.—Suggestions are given for the study of this problem.—*K. L. Anderson.*

162. Wellington, W. G. (*Proc. of Ontario Dept. Lands and Forests, Toronto.*) Some reactions of muscoid Diptera to changes in atmospheric pressure. *Canadian Jour. Res. Sect. D. Zool. Sci.* 24(4): 105-117. 1946.—Laboratory expts. are described that demonstrate that the antennal arista of muscoid Diptera are sensitive to slight fluctuations in pressure, acting as external baroreceptors. Further expts. show that the increase in activity exhibited by flies at low pressure is of a kinetic nature, lacking any directional element, while the reaction of flies to manually-produced waves that vibrate the arista is tactive in a baronegative sense. It is suggested that the erratic prethunderstorm flight of muscoid Diptera results largely from such a baronegative response to localized pressure changes. This suggestion is based on laboratory observations of the reactions of flies under simulated storm pressure patterns.—*Auth. abst.*

## ANIMAL

163. Brown, F. J. A Cheshire starling roost, 1944-5. *Jour. Animal Ecol.* 15(1): 75-81. 4 fig. 1946.—The times

of dispersal and assembly of a roost of starlings (*Sturnus vulgaris*) near Crewe showed an earlier departure before sunrise and a later assembly after sunset from late Nov. to Jan., when the days were shorter, than later in the spring. The duration of the communal flying before descent into the roost and the period of assembly was also shorter during midwinter. Definite flight lines were regularly used but the number of birds using each line varied from time to time as the birds changed their feeding ground. Preliminary assembly before arriving at the roost often occurred at remote points. Birds going to distant feeding areas dispersed first and returned late during assembly thus permitting a nearly equivalent time at their feeding grounds. Starlings occupied one part of the wood and other spp. of birds used the remainder without any sign of hostility.—S. C. Kendeigh.

164. Chambers, V. H. An examination of the pollen loads of *Andrena*: The species that visit fruit trees. *Jour. Animal Ecol.* 15(1): 9-21. 1 fig. 1946.—A technique for the examination of individual pollen loads collected by bees of the genus *Andrena* is described. *A. varians* has a definite preference for fruit-tree pollen and is therefore likely to be of some value as a pollinator of plum, cherry, pear and apple in districts where it is to be found. *A. haemorrhoea*, *armata* and *pubescens*, although frequently taking the pollen of these crop plants and of native *Prunus*—in pure or mixed loads—do not show the same high degree of preference and pollen constancy.—Auth. summ.

165. Freeman, J. A. The distribution of spiders and mites up to 300 ft. in the air. *Jour. Animal Ecol.* 15(1): 69-74. 3 fig. 1946.—The distribution of spiders in the air up to about 300 ft. was investigated by trapping in nets flown from wireless masts at Tetney, Lincolnshire, during 1934 and 1935. The spiders, of which a full list is given, showed a fairly even distribution in the air, the majority being adult and immature Linyphiidae and the young stages of other families. The largest numbers of spiders were found in the air when the temp. was above 64°F, the rel. humidity below 60% and the wind velocity below 12 m.p.h., the last factor having apparently the greatest influence. The occurrence of mites, both free and on the bodies of insects, is also recorded.—Auth. summ.

166. Frost, Winifred E. Observations on the food of eels (*Anguilla anguilla*) from the Windermere catchment area. *Jour. Animal Ecol.* 15(1): 43-53. 1946.—The food of eels has been investigated by the examination of the stomach contents and consists almost entirely of bottom-living invertebrates, molluscs predominating in the Windermere fish and the larvae of aquatic insects in those from the Cunsey Beck and River Leven. This distinction is probably due to the size of the eels examined from the 2 places being different and differences in the faunistic conditions of the 2 environments. The number of eels from Windermere feeding on fish is negligible; the virtual absence of fish from the diet of Cunsey and Leven eels may be accounted for by the size of those examined. Some seaward-migrating eels, including specimens which were changing from the yellow to the silver phase and those which were wholly silver, contained food. In any waters conserved for Salmonidae the food requirements of these fish coincide so closely with those of the eel that serious competition between the spp. may result; this, and the likelihood of the eel being of considerable consequence as a predator on salmon and trout, but, with all, of a most negligible value itself as forage for the salmonids, indicate that its presence is undesirable, particularly in running waters.—Auth. summ.

167. Glasgow, J. P. (Dept. Tsetse Res., Tanganyika Territory.) The seasonal abundance of blood-sucking flies in a grassed woodland area in central Tanganyika. *Jour. Animal Ecol.* 15(1): 93-103. 2 fig. 1946.—Records are presented of catches of *Hippobosca longipennis* and a number of Tabanidae over 30 months, 1940-2. All spp. were taken in greater numbers near streams. All Tabanidae have a 'flight season' when adults are found, and an off-season when they are not. *Phara speciosa* and the Pangoninae appear to have but 1 generation a yr. in Mywapwa. *Mesomyia fallax* probably has 2. The other Tabanidae may have several. Maximum numbers of adults of a particular species do not normally occur in the same month in subsequent yrs., nor do the flight seasons exactly coincide in subsequent yrs. Cattle are not herded close enough to game to enable me-

chanical transmission to occur from game to cattle. The possibility of using other biting flies as indicators for *Glossina* spp. is considered and found unsuitable.—Auth. summ.

168. Jacobs, W. (U. Munich, Germany.) Die hydrostatische Bedeutung der Atmungsorgane von Wassertiere. *Sitzungsber. Ges. Morph. u. Physiol. München* 50: 1-8. 1941.—In a series of air-breathing aquatic animals investigated, whose types of locomotion differ widely, the volume changes of the respiratory organ serve as hydrostatic organs as well as respiratory; these act either to augment locomotion or as respiratory regulations. Several works are cited by the author, after which he sketches briefly original studies on the snail *Limnaea stagnalis*. No correlation exists between specific gravity and various levels and length of submergence in large and small snails. Snails weighted with tiny lead pieces accommodate by increasing the volume of air in air sac. This response appears to be more a reaction to ballast regulation than to additional energy needs for carrying added weights.—A. D. Hasler.

169. Laurie, E. M. O. (Oxford U., Eng.) The coypu (*Myocastor coypus*) in Great Britain. *Jour. Animal Ecol.* 15(1): 22-34. 2 pl., 6 fig. 1946.—The coypu, a S. American rodent, has been bred in Britain for its valuable pelt since about 1929. Most of the fur farms were in the southern and s.-e. counties of England and were given up in 1939 on account of the war. There are records of a number of escapes from these farms and wild colonies of coypus are established at least in parts of e. Norfolk, and on the Dorney sewage farm near Slough, Buckinghamshire. The coypus live along the banks of rivers and streams which they may burrow into, and in marshy land close to open stretches of water. Stomach examinations of 10 specimens showed an entirely vegetable diet. The wt. of 84 coypus caught in Norfolk ranged from 793 g. to 8164 g. excluding wts. of pregnant ♀♀. The heaviest coypu was a pregnant ♀ plus embryos which weighed 10432 g. The heaviest ♂ weighed 8164 g. There does not appear to be any marked difference in the reproductive rate of coypus living wild in Britain and those bred in captivity. Breeding continues throughout the yr., fecundity in both sexes being reached at a wt. of about 1800-2200 g. and at about 5 months old. In captivity the gestation period lasts for 120-130 days, the av. number of young per litter is 5 and there are 2 litters a yr., sometimes 5 in 2 years. Three pregnant ♀♀ had 5, 8 and 9 embryos, respectively. Two specimens of the louse *Pintrufquenia coypus* were obtained from a coypu caught near Norwich. So far it appears to have only been recorded from its type locality in Chile. In Britain the coypu has been the cause of some damage to crops and a little to river banks. More serious damage is being done to the reed-swamp vegetation which it feeds upon and tramples down.—Auth. summ.

170. Lumsden, W. H. R., and A. J. Hadow. The food of the shag (*Phalacrocorax aristotelis*) in the Clyde Sea area. *Jour. Animal Ecol.* 15(1): 35-42. 1 fig. 1946.—The stomach contents of 81 shags (of which 78 were obtained in the Firth of Clyde) consisted very largely of fish. 900 fish, belonging to at least 20 spp., were recovered. Crustacea were of common occurrence in stomachs from certain areas. Large annelids were found from time to time and the remains of a squid were recovered from one stomach. Large numbers of fish otoliths were counted and, whenever possible, identified. The shag feeds mainly on fish of no commercial value and the damage it does to food-fishes is negligible.—Auth. summ.

#### PLANT

171. Böcher, Tyge W. The leaf size of *Veronica officinalis* in relation to genetic and environmental factors. *Dansk Bot. Arkiv* 11(7): 1-20. 1944.—Cultivation expts. under uniform conditions were carried out with 39 samples of *V. officinalis*. It appears that leaf-size and dry matter production vary greatly. There are races with hereditarily very small, small, medium and large leaves. The dry wt. increases with increasing leaf-size. Herbarium studies reveal similar variations. The populations of the Faroes and Iceland, as well as the Danish populations in the outside of woods, differ in leaf-size. Varied-environment expts. were made to show how much the leaf-size is influenced by external conditions. However, the modifiability of the individual race is much less than the total genotypic variation of the species. Frost



resistance depends on the production of matter during the previous summer. One fairly small-leaved sample is monobasic ( $n = 9$ ) whereas 18 with widely differing leaf-sizes are dibasic ( $n = 18$ ). Differences in transpiration, leaf color and flowering time conform more or less to the differences in the leaf-size. In regard to leaf-size *V. officinalis* probably forms a topocline (Oceanic—continental regions) and an ecocline (non-wooded localities—woods). It seems possible to distinguish 4 ecol. groups of races: a sub-alpine-atlantic type, an atlantic-lowland type, a widespread field type, and a woodland type. For the use of taxonomists and phytogeographers the author suggests 4 morphological vars. viz.: microphylla, genuina, media and macrophylla.—T. W. Böcher.

172. Chepil, W. S. (Soil Res. Lab., Swift Current, Saskatchewan.) Germination of weed seeds. II. The influence of tillage treatments on germination. *Sci. Agric. [Ottawa]* 26(8): 347-357. 1 fig. 1946.—The influence of tillage treatments on the longevity of weed seeds in the soil was found to depend in large measure on the period of induced dormancy of seeds. Weeds may be divided into 2 broad categories, those possessing a relatively short period of dormancy of seeds and those possessing a relatively long period. For small seeds possessing a relatively long period of dormancy, the deeper the seeds were buried in the soil the substantially lower was the emergence of seedlings and correspondingly greater was the number of viable seeds that survived the burial period. The highest emergence and the lowest % of viable seeds remaining at the end of the growing season was from seeds lying on the surface of the ground. For seeds possessing a relatively short period of dormancy, such as those of Russian thistle, the depth of burial was of little consequence, for those buried too deeply to emerge soon lost their viability in any case. Periodical cultivation that brought weed seeds nearer to the surface after those originally on or near the surface have germinated, increased the emergence of seedlings and decreased the number of viable seeds in the soil. The treatment was not as effective as if all weed seeds were left on the surface of undisturbed soil. There was higher emergence of seedlings from calcareous clay soil than from loam or sandy loam, but the number of viable seeds surviving different cultural treatments was essentially the same in all soils. Packing after each tillage operation to stimulate the germination of weed seeds was usually ineffective on dryland soils. Irrigation, in addition to natural precipitation, had no appreciable effect on germination nor on longevity of weed seeds in the soil. The earliest emergence of seedlings took place from seeds lying on the surface of the ground and the latest from seeds buried deepest in the soil.—W. S. Chepil.

173. Curtis, J. T. (U. Wisconsin, Madison.) Use of mowing in management of white ladyslipper. *Jour. Wildlife Management* 10(4): 303-308. 1 fig. 1946.—Annual mowing of shrub-infested meadow lands for 5 yrs. resulted in an increase of > 200% in the crown density of *Cypripedium candidum*. Competition with shrubs caused a decrease of 50% in the non-mowed areas.—J. T. Curtis.

174. De Rosayro, R. A. (Forestry Dept., Ceylon, India.) The montane grasslands (patanas) of Ceylon. *Trop. Agric. [Ceylon]* 101(4): 206-213. 1945.—The situation, climate, geology and soils of the montane grasslands and patanas are described. Two types of patana, "wet" and "dry" are recognized. The ecological development of the types is discussed.—C. A. Schroeder.

175. Douglass, A. E. Sequoia survey. III. Miscellaneous notes. *Tree-Ring Bull.* 13(1): 5-8. 5 fig. 1946.—The age of the Gen. Sherman tree was estimated to be 3500 yrs.,  $\pm 500$  yrs., from cores taken on a burnt face. The Gen. Grant may be slightly younger and the Boole tree may be the oldest of the 3 very old sequoias. Four stumps of historical interest, the rings of which have been studied, are described. One windfallen tree showed a taper from 15 ft. diam. at the base to 2½ ft. diam. within 6 ft. of the top. Resistance to decay in fallen trees appeared to be greatest in the outer heartwood. The bark and sapwood often decay completely in 60 yrs. Vertical uniformity of ring growth as shown by the taper study tree just mentioned, was excellent up to within 30 ft. of the top in a 265-ft. tree.—A. D. Moinat.

176. Gregory, Luis E., and Ismael Véles. An ecological survey of the Polytechnic Institute arboretum. *Caribbean*

*Forester* 7: 1-37. 1946.—An ecological survey was made of the arboretum located in western Puerto Rico. The 90 spp. of trees and shrubs and the 80 spp. of herbaceous plants represent 60 families and 140 genera. The principal tree spp. of the upper forest layer are: *Mangifera indica*, *Hymenaea courbaril* and *Inga laurina*. The trees in this layer are 55-65 ft. high and 26-32 inches in diam. In the lower stratum, or understory, *Myrica splendens*, *Eugenia jambos*, *Clacorea guadalupensis* and *Amonis grisea* are the principal spp. These reach a max. height of 8 ft. The ground layer is composed of seedlings, vines and ferns. Of the trees in the upper story, *H. courbaril* may be expected to retain its dominant position in the stand, while *Inga laurina*, being intolerant, will give way to more tolerant spp. *Mangifera indica* will probably die out. In the understory, the myrtle (*Myrica splendens*) will continue its dominance.—L. J. Pessin.

177. Harris, Tom M. (U. Reading, Eng.) Zinc poisoning of wild plants from wire netting. *New Phytol.* 45(1): 50-55. 1946.—In June, 1936, two 1-m. quadrats of mountain pasture were mapped by students of Reading Univ. and enclosed in cages of wire netting against sheep. The changes in the vegetation after 2 yrs. were briefly described in an earlier publication. The quadrats were remapped in 1943, 1944, and 1945, and the changes in the vegetation recorded. These changes appear to be due in part to the exclusion of sheep and in part to a direct harmful action of the cages which apparently poison the plants with zinc.—J. R. King.

178. Häyrén, Ernst. Antropokorer och apofyter i Suurkylä på Hogland sommaren 1939. [Antropochores and apophytes at Suurkylä on Hogland in the summer of 1939]. *Memorand. Soc. Fauna et Flora Fennica* 18: 65-67. 1941.—A list of 76 spp. including 9 spp. reported as new to Hogland.—W. Rosén.

179. Lyon, C. J. Hemlock chronology in New England. *Tree-Ring Bull.* 13(1): 2-4. 1946.—Crossdating of the rings of eastern hemlock (*Tsuga canadensis*) from 6 sites widely distributed over New England was somewhat uncertain. Local chronologies and a sequence of rings of at least 100 appear to be necessary to date hemlock timbers in the New England area. Similar difficulties were shown in the attempted crossdating of New England trees with those of a site in northern Penn. which in general shows rather good agreement of growth minima.—A. D. Moinat.

180. Pettersson, Bror. Botaniska anteckningar från Dyröya och några angränsande öar vid norska västkusten. [Botanical notes from Dyröya and some adjoining islands near the west coast of Norway.] *Acta Soc. Fauna et Flora Fennica* 62 (paper no. 5): 1-36. Map. 1939.—The archipelago near Trondhjem fjord, with which this paper deals, is directly connected to the Frø Islands, investigated by R. Nordhagen (1917). A geographical sketch of the islands is given, followed by a descr. of the vegetation. The phytosociological material is fragmentary and the notes form merely a common descr. of some plant communities. Thus, the author distinguishes minerogenic substrate communities, hygrohaline and supersaline communities, biogenic substrate communities, bird-manured rocks, moors and bogs. A brief account is given of the composition of the communities. The frequency, according to Hult-Sernander's scale, is 1-5. Two characteristic features: no forests, and *Blechnum spicant* of frequent occurrence. An annotated list of spp. contains 219 spp. of vascular plants, 47 mosses and 33 lichens.—W. Rosén.

181. Shirley, Hardy L. (New York State Coll. Forest., Syracuse.) Light as an ecological factor and its measurement. II. *Bot. Rev.* 11(9): 497-532. 1945.—A supplement to the article of the same title that appeared in the *Botanical Review* 1: 355-382. 1935. The following topics are discussed: light measurement, light climate, light requirements for photosynthesis, interrelationship between light and other factors and light and succession. There is a bibliography of 186 citations.—F. T. Addicott.

182. Tinbergen, L. Observations sur l'évaporation de la végétation d'une tourbière dans les Hautes-Fagnes de Belgique. *Mém. Soc. Roy. Sci. Liège, Sér. 4* 4(1): 21-76. Reprinted in: *Arch. Inst. Bot. Univ. Liège* 16(10): 21-76. 1940.—Exposed cushions of *Sphagnum papillosum* have a rapid rate of evaporation, slightly higher than that of herbaceous (prairie) vegetation; whereas evaporation from vegetation consisting of *S. papillosum* covered with *Erica* and *Calluna* is somewhat (6.5%) less. Associations of *Erica* and

*Calluna* without *Sphagnum* have evaporation rates about 40% lower than that of naked *Sphagnum*. In the bog "Fagne wallonne," 20% of the surface is covered with *Sphagnum*, 59% by *Calluna* without *Sphagnum*. Sphagnum areas exhibiting rapid rates of evaporation undergo considerable cooling with a consequent lowering of the mean temp. of the environs. Progressive drainage of the bogs of the Haut-Plateau has reduced the area covered by *Sphagnetum* and, consequently, the over-all evaporation of the region.—R. H. Goodwin.

183. Trochain, Jean. Contribution à l'étude de la végétation du Sénégal. *Mem. Inst. Français Afrique Noire* 2. 1-433. 30 pl. 1940.—A comprehensive ecological study of the vegetation of an area approx. 1/3 of that of France, but one, because of climatic conditions, supporting a relatively poor flora estimated not to exceed 1100 spp. of plants. After a somewhat detailed consideration of climatic, edaphic, and biotic factors in general, a chapter on methods and techniques follows, and this in turn is succeeded by one on major phyto-geographic subdivisions of the entire region. In the succeeding detailed study of the vegetation about 20 associations are considered where the nature of the substratum is the determining factor, such as fresh water and salt water swamps, saline soils, acid soils, and littoral areas. About 30 associations are considered under a 2d major division, where the grouping of plants is detd. by climatic factors. In the last category there are 2 major subdivisions, the Sudan proper, relatively dry, and the densely forested areas. On pages 361-386 is an alphabetic list of Latin names used, and this strangely includes certain new binomials and varietal names printed in black face type, and for the most part indicated as nomina nuda, which they are. As such they have no standing, the new binomials being *Acacia intermedia*, *Lobelia bisannua*, and *Ludwigia senegalensis*. There are ten new varietal names, all nomina nuda, except one, *Chara gymnopus* f. *senegalensis* Migula (p. 386). The volume closes with a general résumé of results, and a very complete bibliography with nearly 400 titles covering the general and special literature involved.—E. D. Merrill.

184. Tyner, Edward H., and Richard M. Smith. (*Agric. Expt. Sta., Morgantown, W. Va.*) The reclamation of the strip-mined coal lands of West Virginia with forage species. *Soil Sci. Soc. Amer. Proc.* 10: 429-436. 7 fig. 1946.—Legislation regarding strip mine reclamation in W. Va. is briefly reviewed. The present regrading of spoil banks is providing many bench terraces and gentle slopes physically suitable for farm operations; hence the interest in forage vegetation for such areas. Three general types of spoil are classified in W. Va., primarily on acidity. The very acid type strongly influenced by weathering of pyrites is difficult to vegetate satisfactorily with any except the most tolerant legumes and grasses. The mixed alkaline to very acid type can usually be satisfactorily covered with various legumes and grasses except for the extremely acid spots which may occur. The 3d type is neither alkaline nor extremely acid and is comparatively uniform. It has given very good legume-grass stands. Lime is essential to any success with the most acid spoil, and is desirable with moderately acid spoil. N fertilizer aids in establishing grasses on all types, and P appears beneficial except with the alkaline spoil. No response has been noted to potash. Manure and mulches have been highly beneficial for quick establishment and for early erosion control. Protection from grazing and care to insure legume stands are essentials for practical stabilization and use of spoil for forage crops. Extremely acid fresh, barren spoil showed total sulfur contents of from 0.64% to 1.21% and pH values as low as 2.45. The sulfur content decreased from 24% to 49% in one year but was still several times higher than on areas that were vegetated.—R. M. Smith.

185. Verhoef, Anni M. E. Onderzoek van Nederlandse Venen. Pollenanalyse en stratigrafie van het veen in het Hurener Veld. [The moors of The Netherlands: M. Pollen analysis and stratigraphy of the peat deposit in the "Hurener Veld."] *Nederland Kruidk. Arch.* 53: 223-231. Map. 1943.—The Hurener Veld, in which the peat deposit is found, lies in the Province of Overijssel (Netherlands). At -40 cm. a faint horizon separates the recent sphagnum peat from the highly humified peat. The subboreal and subatlantic part of the spectrum is normal. The Atlanticum extends to -174 cm., and shows, between -150 cm. and -132 cm., a

zone in which *Betula* instead of *Alnus* dominates. The pre-boreal period, with microspores of *Selaginella selaginoides*, extends to -245 cm.; still lower deposits dating from the late glacial of the 2d or subarctic period are found. Below -245 cm. the pollen of thermophilous trees shows an increase: these deposits belong either to the Riss-Würm interglacial or to Würm stadial period.—C. E. B. Bremekamp.

186. Wasscher, J. De graanonkruidassociaties in Groningen en Noord-Drente. [Weed associations of the corn fields in Groningen and the northern part of Drente.] *Nederland Kruidk. Arch.* 51: 435-441. 1941.

187. Weevers, Th. De suksessie der vegetatie in de Biesbos. [Succession in the "Biesbos."] *Nederland Kruidk. Arch.* 52: 157-158. 1942.—Description of an initial stage of the Saliceto-Populetum in a part of the "Biesbos" which has not yet been diked. (The "Biesbos" is a fairly large stretch of polderland between the provinces Zuid-Holland and Noord-Brabant, which several centuries ago was submerged by the river Meuse, but which has now almost entirely been reclaimed).—C. E. B. Bremekamp.

## OCEANOGRAPHY

(See also Entries 166, 1180, 2319)

188. Allen, W. E. (*U. California, La Jolla.*) "Red water" in La Jolla Bay in 1945. *Trans. Amer. Microsc. Soc.* 65(2): 149-153. 1946.—Although *Prorocentrum micans* and a few other spp. of dinoflagellates were well represented, the principal constituent in the "red water" of 1945 in Sept. was *Gonyaulax polyedra*. The largest number of individual cells found in collections taken daily at the outer end of the pier of the Scripps Inst. of Oceanography was 6,556,000 per liter in water that was definitely red (Sept. 20). In the small abundances of Sept. 11, *Prorocentrum* outnumbered *Gonyaulax*, but in 2 days the latter took the lead in numbers which it held beyond the end of microscopic observations on Oct. 2.—W. E. Allen.

189. Chu, S. P. The utilization of organic phosphorus by phytoplankton. *Jour. Marine Biol. Assoc. United Kingdom* 26(3): 285-295. 1946.—Diatoms were grown in sea-water enriched with  $KNO_3$ , Fe citrate, and various sources of P. *Phaeocystis pouchetii*, *Skeletonema costatum* and *Nitzschia closterium* utilized orthophosphate and phytin P, but not pyrophosphate. The organic P was converted to orthophosphate by chemical and bacterial action. In bacteria-free culture of *N. closterium* forma *minutissima*, phytin and glycerophosphate P and organic P from *Laminaria* fronds were utilized, but not Na nucleinate nor lecithin P. It is demonstrated that the P cycle in the sea may include direct utilization of organic P by phytoplankton as well as conversion of organic P to orthophosphate.—J. L. Fuller.

190. Chu, S. P. Note on the technique of making bacteria-free cultures of marine diatoms. *Jour. Marine Biol. Assoc. United Kingdom* 26(3): 296-302. 1946.—Bacteria-free cultures are best prepd. from flourishing unialgal cultures grown at 10-12°C, constantly aerated and illuminated. Subculturing in artificial sea-water containing no organic matter reduces the number of bacteria. Washing 25 times in sterile sea water yielded bacteria-free diatom cells which could be grown in sterile enriched sea-water or on sea-water agar.—J. L. Fuller.

191. Doty, Maxwell S. (*Northwestern U., Evanston, Ill.*) Critical tide factors in the vertical distribution of marine organisms. *Amer. Jour. Bot.* 33(3): 218. 1946.—An abstract.

192. Fish, Charles J. Oceanography in Japan. *Trans. Amer. Geophys. Union* 27(4): 521-522. 1946.—Since 1929 oceanography has received widespread attention in Japan. 95 vessels were utilized by the Japanese Hydrographic Dept. alone. Open ocean investigations were carried on almost entirely by the navy. During the past 10 yrs. the following civilian institutions have been established: 1) Onomichi Marine Biological Laboratory of Hiroshima Imp. Univ. in 1939. 2) Nanao, Branch Laboratory of the Imperial Fisheries Exptl. Station, 1939. 3) Onagawa Fisheries and Oceanographical Laboratory, Tohoku Imp. Univ. 1940. 4) Hachinohe Meteorological Observatory, General Central Observatory, prior to 1940. 5) Sugashima Marine Biol. Station, Nagoya Imp. Univ., 1941. 6) Oceanographic Division, Institute of Low Temperature Science, Hokkaido Imp. Univ., 1941. 7) Hakodate Marine Observatory, General Meteorological

logical Observatory, 1942. 8) Oshoro Marine Biological Station, Hokkaido Imp. Univ. date not known. In 1941 "The Oceanographic Society of Japan" was founded (address: Central Meteorological Observatory Tokyo) which publishes: a) Journal of the Oceanographic Society of Japan, b) Science of the Ocean.—V. Conrad.

193. Rumbaugh, L. H. Further requirements in oceanographic research for Naval Ordnance application. *Trans. Amer. Geophys. Union* 27(4): 564-566. 1946.—This general review of the activity of the Naval Ordnance Laboratory during World War II contains also the following item of especial interest. "Marine biology.—Two important contributions have been made in this field by the NOL. One was an extensive study of the bathymetric, seasonal, and geographic distributions of fouling organisms, including an investigation of fouling near the bottom at depths down to 30 fathoms. The second was the study and identification of both known and new noise making fishes and other marine life forms by quantitative acoustical methods. This work was carried out in waters of the Atlantic Coast in cooperation with the United States Fish and Wild Life Service, and as a Navy activity in an expedition extending from the Hawaiian Islands to Guadalcanal. Our own studies have recently been supplemented by over 80 recordings obtained by C. J. Fish from the Japanese."—V. Conrad.

194. Torreson, O. W., W. C. Parkinson, O. H. Gish, and G. R. Wait. Ocean atmospheric-electric results. Scientific results of cruise VII of the Carnegie during 1928-1929 under Command of Captain J. P. Ault. *Oceanography III. Carnegie Inst. Washington Publ.* 568: 178 p. 25 fig. 1946. Pr. \$2.25 (paper bound), \$2.75 (cloth bound).

### LIMNOLOGY

(See also Entries 198, 229, 1889)

195. Hsiao, Sidney Chihti. A limnological study of Erh Hai, Yunnan, China: Physico-chemical characteristics. *Jour. Animal Ecol.* 15(1): 1-8. 4 fig. 1946.—Erh Hai is an elongated fresh-water lake, 2034 m. (6675 ft.) above sea-level. It is situated at 25°35'-58'N. and 100°6'-19'E., and has an area of about 259 sq. km. (100 sq. miles). Its basin is shallower on the west and deeper on the east side, where the max. reaches 20.75 m. Its mean depth is 10-15 m. There is strong littoral development on the western side, while the eastern shore is much steeper and consists mainly of wave-cut cliffs. The water is warmest in Aug. and coolest in March. The annual range of mean subsurface is 24.04-12.82°C. The annual heat budget is estimated at 12,000-18,000 g. cal./sq. cm. There is no stratification, the subsurface temp. being fairly uniform. Erh Hai water has a chlorinity of 46.13 ppm. Its O<sub>2</sub> content varies between 3.5 and 5.4 ml./l. (5-7.8 ppm.). There is no O<sub>2</sub> deficiency, but supersaturation is the rule in the surface layer. In the subsurface layers the variations in dissolved O<sub>2</sub> are small. In the limnetic water H-ion conc. also shows little variation. The pH value is 8-8.4. But in enclosed bays with abundant growth of plants, both benthic and planktonic, the pH value is higher—9.05-9.1. Reasons are given for considering Erh Hai an eutrophic lake of the temperate class of the 3d order.—*Auth. summ.*

196. Van Nieuwenhoven, P. J. Onderzoek naar het voorkomen van submerse Phanerogamen en van Gastropoden in het polderwater van Noordholland. [An inquiry into the presence of submerged Phanerogames and of Gastropods in the canals of the Noordholland polders.] *Nederland Kruidk. Arch.* 52: 333-370. 1942.—The author tries to find out whether there is a correlation between the Cl content of the canal water and the nature of the submerged vegetation and the number of different gastropods. The canal vegetation appeared on the whole to be poorer in the lowlying polders in which the Cl content of the water reaches its highest value. The various constituents of this vegetation could be divided in those that are indifferent to the degree of salinity, those that show a preference for saline water and those disliking the latter. As the last-named group is the largest of the 3, the number of spp. increases when the salinity decreases. The gastropods show no preference for special plants or for plant communities of special composition, although on the whole they appear to prefer communities that are rich in species. There are in the polders a large number of springs producing more or less saline water, and some of them produce large

amts. of gas. The latter seem to be detrimental to the submerged vegetation.—C. E. B. Bremekamp.

### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 147, 272, 2421)

197. Bauman, Aden C. (Missouri Conserv. Comm., Jefferson City.) Bait minnow production in ponds. *Missouri Conservationist* 7(6): 3-5. 7 fig. 1946.—Production is simple and cheap, if certain rules are followed. The pond must be deep enough to prevent winter-kill and withstand drought; it must be fenced to exclude livestock and must contain no other fish. Two good bait minnows suitable for pond culture are the black-head (*Pimephales*) and the golden shiner (*Notemigonus*). Brood-stock should be selected from a reliable source. Black-heads stocked at the rate of 300 adults per water-acre will produce about 85,000 bait-sized minnows per acre per yr. on the average. Spawning facilities for this species should be provided by sticking shingles into the bank at an angle in water up to 1½ ft. deep. For golden shiners, controllable aquatic vegetation or sunken mats of straw or hay are recommended spawning devices. Golden shiner adults planted at the rate of 100 per acre will produce from 6,000 to 50,000 minnows per acre in one growing season. Growth can be speeded up by applying a 4-12-4 mix of commercial fertilizer in the water in weekly applications of 100 lb. per acre until 1 ton per acre per season has been added. Addition of lime in amt. equal to ½ the wt. of fertilizer is a benefit.—W. O. Nagel.

198. Campbell, Robert S. (U. Missouri, Columbia.) Limnology—study of factors that make good fishing. *Missouri Conservationist* 7(9): 12-14. 3 fig. 1946.—A factor of prime importance in fish production is the food-chain. As fertility determines the yield from land, so down at the end of the food chain it is fertility that limits the productivity of water. Chemical fertilizers can be used to good advantage in water, working through the food-chain. Other important factors are oxygen, acidity, temp., turbidity and shape of the basin. Only when we understand the complex food-chain and other factors will we obtain a sustained maximum production of fishes.—W. O. Nagel.

199. Carlander, Kenneth D. (Minnesota Dept. Conserv., St. Paul.) Age, growth, sexual maturity, and population fluctuations of the yellow pike-perch, *Stizostedion vitreum vitreum* (Mitchill), with reference to the commercial fisheries, Lake of the Woods, Minnesota. *Trans. Amer. Fish. Soc.* 73: 90-107. 1945.—The scale method of growth analysis is valid for pike-perch of Lake of the Woods, and body-scale relationship is that of a 3d-degree polynomial. Length calculations employed corrected body-scale relationship. Females grow more rapidly than ♂♂, but differences are small. Lee's phenomenon is pronounced and is apparently related to selective removal of faster-growing fishes by the commercial fishery, and growth rate is more rapid during yrs. with high mean summer temps. Wt. increases approx. as the standard length raised to the 3.1 power. Males mature when 4 yrs. old but ♀♀ usually not until the 5th or 6th yr. Fluctuations in abundance of pike-perch are pronounced and the commercial catch suggests a 10-yr. cycle of abundance. Fluctuations are associated with relative strength of year classes but causes of differences are not evident. Fry planting could not be correlated with strength of year classes or subsequent commercial catch. Depletion of pike-perch is indicated by rapid decline in catch from 1935 to 1939 and is probably due to destruction of spawning beds by pulp mill wastes and the heavy commercial fishery. Increase in size limits is recommended to increase total catch and provide larger spawning stock. Greater removal of saugers and perch is recommended to utilize these species in proportion to their abundance. Present practices favor their survival over that of pike-perch.—L. L. Smith, Jr.

200. Carlander, Kenneth D. (Minnesota Dept. Conserv., St. Paul.) Growth, length-weight relationship and population fluctuations of the tullibee, *Leucichthys artedii* tullibee (Richardson), with reference to the commercial fisheries, Lake of the Woods, Minnesota. *Trans. Amer. Fish. Soc.* 73: 125-136. 1945.—The body-scale relationship of the tullibee, an important commercial fish in Lake of the Woods, can be described by a 3d degree parabola. Growth calculations were made with corrected body-scale relationship. Greatest growth in length occurs during the 1st yr. of life and annual increment decreases each succeeding yr. Males



and ♀♀ grow at approx. the same rate. The appearance of Lee's phenomenon is pronounced and probably is due to differential mortality between slow-growing and fast-growing fish. Weight increases approx. at a rate proportional to the 3.2 power of the standard length and an average "K" of 1.99 was recorded. Av. sex ratio was 2 ♂♂:3 ♀♀ with the majority of fish spawning for the first time at the end of the 3d yr. Commercial take of tullibee was small from 1933, to 1937 but increased to two million pounds in 1939 and 1940. Increased utilization was followed by marked change in age and size distribution in the population. When intensive fishing was started in 1939 the predominant age was 4 yrs. In 1941, 2- and 3-yr.-old tullibee predominated in the catch. Indications are that present population is not large enough to maintain max. potential yield.—L. L. Smith, Jr.

201. Carson, Rachel L. Fish and shellfish of the Middle Atlantic Coast. U. S. Dept. Interior Fish and Wildlife Serv. Conserv. Bull. 38: 1-32. 12 maps, 18 fig. 1945.—After preliminary discussion of fishing gear, fishing grounds, and the principles of conservation, brief accounts are given of 23 spp. of fish and shellfish of commercial importance. Distribution, abundance, feeding habits, etc., are discussed.

202. Chamberlain, Thomas K. Research in stream management in the Pisgah National Forest. Trans. Amer. Fish. Soc. 72: 150-176. 1943.—Five yrs. of exptl. stream management with 150 miles of trout stream, divided between 6 watersheds in the Pisgah National Forest of N. Carolina, resulted, after various management practices were tried, in an increase of approx. 300% in anglers and in number of fish caught. After the 1st yr., all hatchery fish were marked by fin clipping before being planted. Recoveries from plantings made at different seasons showed a 5-fold increase in recovery of spring planted legal-sized trout (rainbow, *Salmo irideus*; brown, *S. trutta*; and eastern brook, *Salvelinus fontinalis*) over trout of near equal size planted in the fall. During the last yrs. of the exptl., emphasis was placed on stocking with legal sized fish in the spring. Success indicates that this method is the best means of meeting increased fishing demand. Unfavorable practices, such as closing a stream to fishing every other yr., were discontinued. Because of the requirement that a complete creel census be taken over widespread fishing areas with a limited personnel, a fishing schedule was evolved, staggering the open days for the different streams under an arrangement called "The Pisgah System." While the system permitted only one watershed to be opened at a time, it was found adequate to meet the increasing fishing intensity by spreading the fishing fairly evenly.—T. K. Chamberlain.

203. Davison, Verne E. Growing pains of pond management. U. S. Dept. Agric. Soil Conserv. 11(8): 180-183. 1946.—Five basic rules for successful farm fish pond management are presented and 16 common errors and misconceptions are discussed.—E. Winters.

204. Degani, John G. Studies of the toxicity of ammunition plant wastes to fishes. Trans. Amer. Fish. Soc. 73: 45-51. 1945.—The red liquor from the manufacture of trinitrotoluene (T.N.T.) was suspected. The constituents of this waste include dissolved T.N.T. and toluene, both of which are very toxic. Many other compounds which may be very toxic are also present. Certain minnows are similar in sensitivity to trout yolk sac and very young fry of the trout. The red liquor waste from T.N.T. manufacture was found to kill these fishes when the dilution of an average sample was 600 times or less. A safe dilution is probably 1,000 times during the cooler months. A rise in temp. which occurs in streams at the time of low water increases toxicity and requires greater dilution when it is actually least.—V. E. Shelford.

205. DeLacy, Allan C., and W. Markham Morton. Taxonomy and habits of the charrs, *Salvelinus malma* and *Salvelinus alpinus*, of the Karluk drainage system. Trans. Amer. Fish. Soc. 72: 79-91. 1943.—Two species of charr occur in the Karluk watershed on Kodiak Island, Alaska. Differences between the 2 spp. were shown by the results of tagging expts., stomach examinations of > 5000 charrs, and the analysis of comprehensive morphometric and meristic data. The dolly varden charr, *S. malma*, is typically anadromous, spawns in streams, and usually has < 20 gill rakers and 35 pyloric caeca. The red lake charr, *S. alpinus*, of Karluk Lake is not anadromous, spawns in the lake, and has >

20 gill rakers and usually > 35 pyloric caeca. *S. malma* occurs on the rim of the North Pacific Ocean from northern California to Japan and Korea. *S. alpinus* is circumpolar in distribution.—A. C. DeLacy.

206. Eschmeyer, R. W. The effect of impoundment on fishing intensity in several TVA waters. Trans. Amer. Fish. Soc. 72: 103-107. 1943.—Fisherman counts on 2 pre-impoundment areas in the Tennessee Valley are compared with similar counts on completed reservoirs. On the basis of these counts it is estimated that fishing in the Cherokee Reservoir area will increase almost 50-fold 5 yrs. after impoundment; on the Watts Bar Reservoir area fishing is expected to increase 10- to 15-fold several yrs. after impoundment.—R. W. Eschmeyer.

207. Fish, Frederic F. (2725 Montlake Blvd., Seattle, Wash.) The anaesthesia of fish by high carbon-dioxide concentrations. Trans. Amer. Fish. Soc. 72: 25-29. 1943.—A practical and economical method for anaesthetizing adult salmon and steelhead trout in the fish trucks used in the Grand Coulee fish salvage program is described. The method consists in generating a predetermined CO<sub>2</sub> conc. in the 1000-gallon tanks of the trucks through the successive addition of predissolved NaHCO<sub>3</sub> and dilute H<sub>2</sub>SO<sub>4</sub> in proper quantities. CO<sub>2</sub> anaesthesia effectively solved the acute problem of species segregation in the fish salvage program and, with minor modifications, could be used with equal success in certain hatchery operations necessitating the handling of large fish.—F. F. Fish.

208. Glancy, Joseph B. (General Seafoods Corp., N. Y. C.) Utilization of the surf clam *Macra solidissima*. Trans. North Amer. Wildlife Conf. 10: 294-297. 1945.—The surf clam (*M. solidissima*), also known as hen clam or skimmer, formerly used commercially as bait for ground fish, has begun to get wide acceptance as human food. In 1944, over 2,000,000 pounds of surf clam meats were marketed—fresh, frozen, and canned. New techniques in dredging, washing—using oyster methods—plus quick-freeze processing and distribution, all have aided in the development of a dormant U. S. seafood resource. There seems to be a very great dearth of biological knowledge of the sea clam upon which to base conservation laws to prevent depletion of these clams.—J. B. Glancy.

209. Hasler, Arthur D. (U. Wisconsin, Madison.) Some recent cooperative researches at Wisconsin in fishery biology. Trans. North Amer. Wildlife Conf. 10: 260-266. 1945.—Summaries are given for research cooperation in fishery biology and limnology at the Univ. of Wisconsin, 1939-1945. Emphasis is placed upon the role played by interdepartmental cooperation in attacking a variety of subjects and problems: endocrinology, comparative fish physiology, turnover in fish populations, migration, tagging with thorotrast, stream surveys, minnow culture, phytomacrobenthos of the littoral zone.—A. D. Hasler.

210. Hasler, Arthur D., Hans P. Thomsen, and John Ness. (U. Wisconsin, Madison.) Facts and comments on raising two common bait minnows. Wisconsin State Conserv. Dept. Bull. 210-A-46. 1-14. 6 fig. 1946.—Notes on the choosing of a site, constructional precautions, and life history.

211. Heacox, Cecil. (New York State Conserv. Dept., Rochester.) Fin regeneration in brown trout. Trans. Amer. Fish. Soc. 72: 231-232. 1943.—Observations were made on types and degrees of regeneration of clipped ventral fins of 6000 artificially propagated yearling brown trout [*Salmo trutta fario*]. Wiss scissors No. 624½ were used for clipping and the fish were rendered momentarily comatose by electric shock. Examination of a 10% sample 5 months after clipping indicates fin clipping to be an effective method of marking for future identification trout of this species, size and age.—Cecil Heacox.

212. Herndon, G. B. (Missouri Conserv. Comm., Jefferson City.) Can we expect good fishing in big, man-made lakes? Missouri Conservationist 7(3): 4-5, 11. 3 fig. 1946.—The Conservation Commission has endorsed a "Statement on State Water Policies for Missouri" which outlines a program of conservation, storage, and control of surface waters; it has insisted that recreational planning must proceed with other phases of water development, because past events prove that recreation has been an incidental by-product of industrial water development in spite of the fact that recreational benefits have more popular appeal than any

other aspect of such development. Fish production is limited by the food, cover and other habitat requirements water affords; a newly-created water area often provides these at first, but with lack of management populations of catchable-sized game fish quickly decline and remain thereafter at an unsatisfactory level. Special regulations, including longer open seasons and removal of length limits may help, but cannot satisfactorily overcome the handicaps of violent fluctuations in water levels and excessive siltation on impoundments operated without due consideration to recreational values.—*W. O. Nagel.*

213. Herndon, G. B. (*Missouri Conserv. Comm., Jefferson City.*) Keeping tabs on fish supplies and fishing luck. *Missouri Conservationist* 7(5): 2,3. 2 fig. 1946.—Continuing inventory is essential to good fish management. Two new and continuing techniques for Missouri are being initiated: (1) a creel census, and (2) population census by electric seining. Creel censusing is done by all Conservation Agents in covering all types of waters and checking all types of fishermen. Electric seining is done by a technical fisheries crew. Many answers to questions important to the angler as well as to management knowledge may be obtained from these projects, and every effort is being made to secure the needed data with the least inconvenience to fishermen.—*W. O. Nagel.*

214. Heydecker, Wayne D. (*Atlantic States Marine Fish. Comm., N. Y. C.*) Interstate cooperation in the fishery field on the Atlantic coast. *Trans. North Amer. Wildlife Conf.* 289-293. 1945.—The Atlantic States Marine Fisheries Commission, new cooperative study agency created by interstate compact in 1942 with consent of Congress, represents most of the Atlantic States. Each state has 3 Commissioners. States contribute to the support of the Commission according to the value of their annual catch, and the Commission receives no other funds. It is advisory only and is the outgrowth of the movement for interstate cooperation sponsored by the Council of State Governments since 1936. It achieves results through cooperation and conference. The U. S. Fish and Wildlife Service under the compact is the primary research agency of the Commission. The Commission is divided into North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections for discussion of common problems. It also has panels on particular spp. Uniform size laws for lobster, striped bass (rock-fish) and blue crab, sponsored by the Commission, have been widely adopted. The Commission serves as mediator in interstate conflicts. It is promoting uniform state catch statistics and is working for restoration of the once great Delaware shad run. Committees on fisheries education and stabilization (management) have produced significant reports. The Commission represents a new concept in inter-governmental relations, with a practical program. It is proving that results are attainable where states accept responsibilities and cooperate to fulfill them.—*W. D. Heydecker.*

215. Jobs, Frank W. The age, growth, and bathymetric distribution of Reighard's chub, *Leucichthys reighardi* Koelz, in Lake Michigan. *Trans. Amer. Fish. Soc.* 72: 108-135. 1943.—The age and growth of 331 Reighard's chub taken in 1932 were detd. Each of the other phases of the study is based on > 5,000 specimens collected during the yrs. 1930-1932. *L. reighardi* were taken in all depths where nets were set from 12 to 97 fathoms, and in water with temps. that varied from 34.7 to 50.6°F. The depth of greatest abundance, when not spawning, was 20-60 fathoms where the temp. of the water ranged from 38.8 to 40.6°F. Spawning occurred during May and June at depths of 20-79 fathoms, over a wide variety of bottom materials at temps. of 38.8-40.5°F. The abundance on the east shore was 7 times that on the west shore and between 2 and 3 times that in the upper part of the lake. The existence of separate populations on the 2 shores is indicated. Age-group IV dominated in the samples of fish whose ages were detd., and made up 50.2% of the total. Age-groups V and III were the next largest groups in that order. Growth in length was most rapid during the 1st yr. of life, and growth in wt. was most rapid during the first 3 yrs. with the annual increment in wt. about the same in each of those yrs. The sexes grew at approx. the same rate in both length and wt. Growth compensation occurs in the *reighardi* of Lake Michigan. The wt. of the fish in the combined samples increased as the 2.468 power of the length.

No relationship between condition (K) and rate of growth could be demonstrated. Seasonal changes in relative heaviness followed the same general trend, irrespective of sex or stage of sexual maturity. The ♀♀ lost 8% of their weight on spawning, but no loss could be demonstrated for the ♂♂. The ♀♀ were always strongly dominant in the samples except during May and June 1931 and May 1932 when the sexes occurred in about equal numbers. The relative abundance of the sexes did not change greatly in age-groups II-V. No ♂♂ were assigned to age-groups VI and VII.—*F. W. Jobs.*

216. King, Willis. Lake management studies in the Sandhills Wildlife Management area. *Trans. Amer. Fish. Soc.* 72: 204-211. 1943.—The N. Carolina Division of Game and Inland Fisheries is developing a wildlife management area, including several lakes, in the Sandhills country of the south-central part of the State. The lakes are being developed and managed for public fishing. Three lakes were opened for the first time in 1941, and in 1942, four lakes were opened to public fishing. All lakes were stocked with largemouth black bass, *Huro salmoides*, and mixed bluegills, *Lepomis m. macrochirus* and *L. m. purpureus*. Special permits were sold, and all catches were weighed and measured. A season of 10 weeks was permitted in 1941, and one of 6 weeks in 1942. In 1941, 769 successful anglers caught 5,127 fish, weighing 2,611 lb., from 121 acres of water. In 1942, 343 successful anglers caught 1,649 fish, weighing 853 lb., from 142 acres of water. Two lakes opened in 1942 for the first time, following stocking with legal-length largemouth black bass and bluegills, showed returns of 38% of the bass and 25% of the bluegills in one lake, and returns of 10% of the largemouth bass and 7% of the bluegills in the other lake. This percentage of recapture throws some doubt on the advisability of stocking a new lake with legal-length fish in preparation for opening it to public fishing. There is evidence that the application of commercial fertilizer increased the yield of fish in one lake. Additional new lakes are under construction, and excellent opportunities will be presented for future studies in management and fish production.—*Willis King.*

217. Langlois, Thomas H. (*Franz Theodore Stone Lab., Put-in-Bay, Ohio.*) Water, fishes, and cropland management. *Trans. North Amer. Wildlife Conf.* 10: 190-196. 1945.—The primary human needs for water are to supply food-plants and animals and for human consumption. Certain other uses of water have conflicted with the best use of water to meet these primary needs, and there is acute need for able biological engineering to avoid scarcity of adequate supplies of suitable quality. This is illustrated by the history of the biological productivity of Lake Erie. Water "crops" must include all kinds of aquatic plants and animals, and the productive area of Lake Erie must be recognized as including its bays and tributary streams. To some extent it must include those land areas which shed their water to make those tributary streams, because the nitrates and other salts which are washed off the land into the streams form the basic nutrient materials for the primary crops of aquatic plants in the lake. Farming practices have changed the streams from permanent to intermittent flow, and from clear to turbid water. The silt loads carried downstream have changed the bays from heavily vegetated areas with little bankwash to vegetationless areas with great bankwash. Small streams now have insufficient flow during many months to keep their mouths flushed open. Dams have been built at the lower end of the rapids where fishes used to spawn, and industrial pollution now acts as a physiological barrier to prevent essential fish migrations. The food-fish production of the commercial fishery has illustrated the varying abundance of all species with the decline of those kinds whose needs are no longer well met. The things which must be done to maintain the capacity of Lake Erie and its tributary streams to produce fish must be done also to maintain the capacity of the lands of northern Ohio to produce farm crops, to provide good hunting in the valleys, to protect the water supplies of the people and industries of many cities, and to protect the farms, homes, and cottages on the shores of L. Erie and its bays: namely, wiser use of the lands and waters, and this calls for coordinated efforts.—*T. H. Langlois.*

218. Lyman, F. Earle, and Jack S. Dendy. (TVA, Norris, Tenn.) A pre-impoundment bottom-fauna study of

**Cherokee Reservoir Area (Tennessee).** *Trans. Amer. Fish. Soc.* 73: 194-208. 1945.—Pre-impoundment bottom-fauna data from 5 stations are presented for the Cherokee Reservoir area, Tennessee. Production was found to be much lower in the deep-water pools than in the shallow-water riffle areas. In the riffle areas the 2 taxonomic groups, Trichoptera and Diptera, made up 93.3, 81.4, and 92.8% of the total population, while the Trichoptera and Sialidae comprised 69.3, 80, and 88.4% of the total vol. at 3 stations. The gradual increase in vol. over a period of 3 months at the most productive station was concluded to be due almost entirely to the increment in numbers of Trichoptera rather than to the growth of individual organisms. Pollution of the Holston River by sewage and industrial wastes was an important factor that limited production of bottom organisms. Physico-chemical data are given and are correlated with bottom-fauna data to support the contention that pollution resulted in a decrease in the fauna upstream toward the source of pollution. It is concluded that impoundment of the Holston R. by Cherokee Dam will reduce the effects of pollution in the reservoir area. It is expected that the principal components of the Holston R. bottom fauna will not survive impoundment and that, whatever organisms do survive impoundment or invade the reservoir area, the total production per unit area will not be as great in the reservoir as it was in the original river channel. Comparisons between the pre-impoundment bottom fauna of the Cherokee and Watts Bar Reservoir areas point to the fact that while Cherokee is the more productive, the bottom fauna at Watts Bar has a better chance of surviving impoundment, and hence, that Watts Bar Reservoir will probably produce more bottom organisms than did the original river. This contrast is a result of environmental differences between the habitats of the 2 areas.—*Auth. abst.*

219. Meehan, O. Lloyd. (*U. S. Fish and Wildlife Serv., Chicago*.) Gain in weight per acre per day as a measure of production in fish rearing ponds. *Trans. Amer. Fish. Soc.* 73: 220-230. 2 fig. 1945.—The shortcomings of total wt. or number of fish produced per acre as measures of production in hatchery rearing ponds are recognized. The variation in ecological conditions from pond to pond and differences in the number of days of growth are factors which preclude accurate comparison of production at different hatcheries or in separate ponds. Gain in wt. per acre per day is proposed as a more adequate measure and is applied to ponds fertilized with various fertilizers and with different sources of water supply to show its applicability.—*O. L. Meehan.*

220. Meehan, O. Lloyd, and Francis Marzulli. (*U. S. Fish and Wildlife Serv., Welaka, Fla.*) The relationship between the production of fish and the carbon and nitrogen contents of fertilized ponds. *Trans. Amer. Fish. Soc.* 73: 262-273. 1945.—Hatchery ponds for the production of large-mouth black bass were fertilized with cottonseed meal at a rate (based on the amt. of N) which experience showed would produce optimum survival of fingerling fish. This was supplemented with lime and colloidal phosphate in varying amts. Hay was also used along with N, lime, and colloidal phosphate. There was an inverse relationship between production in pounds of fish per acre per day and humus in the pond bottom as well as the amt. of organic and total N in the water. A positive correlation occurred between fish production and the C/N ratio in the pond bottom taken after fertilization was stopped.—*O. L. Meehan.*

221. Menzel, R. Winston. (*Virginia Fish. Lab., Yorktown*.) The catfish fishery of Virginia. *Trans. Amer. Fish. Soc.* 73: 364-372. 1945.—The catfish fishery of Virginia is conducted mainly on the James River and its tributaries and on the Potomac River. The approximate average sizes of catfish taken in the commercial catches are: channel catfish, *Ictalurus lacustris punctatus*, slightly over 1 pound; white catfish, *Ictalurus catus*, about 1 lb.; and bullheads, *Ameiurus n. nebulosus* and *A. natalis*, almost 1/2 lb. On the basis of catch records of individual fishermen of the James River, it is concluded that the amount of fishing effort has more than doubled since 1929. Although there has been a marked increase in the amt. of gear used, the volume of catch has not increased proportionately. A decrease in the av. size of fish in the commercial catch seems to have occurred. A comparison of the amt. of fishing, volume of catch, and size of fish indicates that the commercial catch in the James R. is probably greater than the river can continue to support with-

out a significant decline in the size and abundance of fish. Three remedial measures are considered to be desirable and practical: the taking of channel catfish under 11 inches long and of white catfish, *Ictalurus catus*, and bullheads under 10 inches long, should be prohibited; catfish should be culled immediately after they are caught and the undersized fish returned to the water alive; a minimum size limit on dressed fish should be established.—*R. W. Menzel.*

222. Miller, Lawrence F. A comparison of the hoop-net catches in several fish habitats of Wheeler Reservoir. *Trans. Amer. Fish. Soc.* 73: 37-40. 1945.—Hoop nets were fished in all 4 major habitats in Wheeler Reservoir, a TVA main-stream impoundment, during a 6-month period in 1941. Longnose gar, mooneye, skipjack, mud catfish, black bullhead, white bass, sauger, and crappie were best represented in the catch from the fast tailwater; drum were taken in greatest numbers in the upper 1/3, which had retained many of the characteristics of the original river; rough-fish spp. were most commonly caught in the middle section with its extensive shallow backwater; and Kentucky bass were best represented in the lower 1/3, where the water is less turbid than in other portions of the reservoir.—*L. F. Miller.*

223. Miller, Richard B. (*U. Alberta, Edmonton, Canada*.) Effectiveness of a whitefish hatchery. *Jour. Wildlife Management* 10(4): 316-322. 1946.—A long term expt. to test the effectiveness of the Alberta whitefish hatchery was begun in 1941 by planting "eyed" eggs in a series of lakes on alternate yrs. Subsequent year class strengths, detd. by samples from the commercial catch, were then compared. Evidence from the first 5 yrs. indicates that hatchery supported year classes are no stronger than those not so supported in a series of lakes 12 to 462 sq. miles in area. Preliminary observations on the efficiency of natural reproduction indicate that about 10% of the eggs survive to become fry. This is sufficient to produce roughly 100 times the number of fish which a lake can support. The introduction of additional stock from a hatchery is, therefore, unlikely to increase production.—*R. B. Miller.*

224. Miller, Robert R. (*U. S. Nation. Mus., Washington, D. C.*), and J. R. Alcorn. (*U. S. Fish and Wildlife Serv., Fallon, Nev.*) The introduced fishes of Nevada, with a history of their introduction. *Trans. Amer. Fish. Soc.* 73: 173-193. 1945.—At least 39 spp. and subspp. of fishes have been introduced into the waters of Nevada between 1873 and 1943. Of these, 24 kinds are now known to occur in the State. A thorough survey of the exotic fishes has not been made, but specimens or records of introduced spp. have been kept in the course of rather extensive collecting of the native fish fauna from 1934 to 1943. Consequently, it is believed that the number of introduced spp. herein enumerated approaches a complete tabulation. Some additions among the sunfishes and catfishes may be expected. The annotated list is divided into 2 parts: spp. now present in the State, and spp. introduced but never established. The established kinds constitute about 2/3 of the total number of known native spp., but are far outnumbered by the indigenous fishes when all the local subspp. are included. The stocking of cutthroat trout and rainbow trout in the same creek should be discouraged since these 2 spp. hybridize extensively and the cutthroat trout are speedily eliminated. Brook trout and cutthroat trout, however, do not hybridize. A suggested practice would be to select separate streams when planting rainbow and cutthroat species, a procedure greatly simplified by the presence of many isolated creeks throughout the State. The further distribution of the green sunfish, *Lepomis cyanellus*, is not recommended as this sp. is a serious competitor and does not reach a size suitable for game fishing.—*R. R. Miller.*

225. Moffett, James W., and Burton P. Hunt. (*Michigan Inst. Fish Res., Ann Arbor*.) Winter feeding habits of bluegills, *Lepomis macrochirus* Rafinesque, and yellow perch, *Perca flavescens* (Mitchill), in Cedar Lake, Washtenaw County, Michigan. *Trans. Amer. Fish. Soc.* 73: 231-242. 1 fig. 1945.—The stomach contents of 1,128 bluegills and 211 yellow perch taken during winter from Cedar Lake, Washtenaw County, Michigan, were examined. Bluegills consumed aquatic insects, chiefly mayfly nymphs, in early and late winter and plankton (Cladocera) in midwinter. The average quantity of food consumed was 0.036 ml. There was some correlation noted between prolonged periods of warm weather and increased food consumption. Young



bluegills constituted 60% of the volume of the yellow perch diet although great numbers of Ostracoda were eaten in mid-winter. The av. volume per perch stomach was 0.26 ml. Predation by perch on young bluegills is presumed to be an important factor in regulating the bluegill population.—*Authors.*

226. Needham, P. R., and Daniel W. Slater. Seasonal changes in growth, mortality, and condition of rainbow trout following planting. *Trans. Amer. Fish. Soc.* 73: 117-124. 1945.—Gives data from exptl. plantings of trout in Convict Creek (Calif.) in relation to changes in growth, mortality, and condition from month to month over 2 summer seasons. Survivals of 33% and 56% were obtained over periods of 151 and 179 days, respectively. Wild fish grew approx. twice as fast as planted fish each season. The coeff. of condition of planted rainbows fell consistently for the first few months after planting. A parallel loss in condition of wild trout occurred but was less marked. "Conditioning" apparently had no appreciable effect on survival rates.—P. R. Needham.

227. O'Donnell, D. John. (Wisconsin Conserv. Dept., Madison.) The fish population in three small lakes in northern Wisconsin. *Trans. Amer. Fish. Soc.* 72: 187-196. 1943.—An analysis of the total fish populations in 3 northern Wisconsin lakes, as revealed by the use of a derris-root treatment, designed to eradicate an undesirable carp population, is presented. The lakes were all bass lakes that had become infested with carp. A conc. of 1.25 lb. of derris root (5% rotenone) was used per acre-foot of water. Preliminary, intensive netting operations were conducted to test the efficiency of 1/2-inch-mesh (stretched measure) fyke nets in estimating fish populations. From 10.4 to 15.6% of the total wt. of the fish present and from 6.8 to 31.1% of the total number of individuals were caught. Long Lake (27.1 acres), contained a "total standing crop" of 59,072 fish or 2,180 per surface acre. The total wt. was 3,657 lb. (135 lb. per acre). East Twin Lake (13 acres) had a population of 20,159 fish (2,413.5 lb., or 186 lb. per acre). West Twin Lake (13.5 acres) gave a population of 5,809 fish, with a total wt. of 1,243.2 lb. (92 lb. per acre). The role of the various spp. of fish in the community is discussed. The 3 lakes were restocked according to a fish-management plan.—D. J. O'Donnell.

228. O'Donnell, D. John. (Wisconsin Conserv. Dept., Madison.) A case of ossification of the spinal column in fishes. *Trans. Amer. Fish. Soc.* 73: 41-44. 1 fig. 1945.—A peculiar carp (*Cyprinus carpio*) was caught in the upper Illinois River. The fish was 7 yrs. old and had a total length of 9 inches as compared to 20 in. for a normal carp of like age. The last 8 thoracic and the 17 caudal vertebrae had been softened and squeezed together, and ossification and the formation of new bone had caused permanent fusion. The condition has been named Spondylitis ossificans piscium and bears a marked resemblance to Arthritis deformans. Possible causes of the condition are discussed.—D. J. O'Donnell.

229. O'Donnell, D. John. (Wisconsin Conserv. Dept., Madison.) Control of Hydrodictyon reticulatum in small ponds. *Trans. Amer. Fish. Soc.* 73: 59-62. 2 fig. 1945.—A condition of algal nuisance in small ponds involving the water net, *H. reticulatum*, is described. A serial treatment with CuSO<sub>4</sub>, in which daily applications of 0.33 ppm. of the chemical are made, resulted in the complete removal of the algae in 5 days. 16 ponds are kept free of algae by serial treatments with CuSO<sub>4</sub> at regular intervals. The advantages of serial treatment over 1-dose-treatment are discussed.—D. J. O'Donnell.

230. Phillips, Arthur M. Jr., and George S. Hewitt. (Fish and Wildlife Serv., Leavenworth, Wash.) Evaluation of salmon flesh and salmon viscera in the diet of chinook salmon fingerlings. *Trans. Amer. Fish. Soc.* 73: 63-69. 1945.—Addition of salmon flesh and salmon viscera to a diet for chinook salmon (*Oncorhynchus tshawytscha*) fingerlings produced growth equal to that resulting from all-meat diets. The cost of production was reduced considerably. Salmon flesh did not prevent the appearance of an anemia and is considered deficient in the anti-anemia factor. Some evidence obtained indicated that salmon flesh might have a destructive influence upon the anti-anemia factor present in other foods. This effect may be similar to that exhibited by other frozen fish upon vitamin B<sub>1</sub>. Salmon viscera in the diet prevented anemia in some instances and it is presumed, therefore, to contain some anti-anemia factor. However it should

not be fed as a sole diet over long periods at the Leavenworth Station.—A. M. Phillips, Jr.

231. Poulsen, Erik M. (Danish Biol. Sta., Copenhagen, Denmark.) On fluctuations in the size of the stock of cod in the waters within the Skaw during recent years. *Rept. Danish Biol. Sta.* 46: 1-36. 13 fig. 1941.—This study of the annual fluctuations in the amt. of cod fry was made from 1923 to 1939 in an effort to determine the cause of such fluctuations and their effect upon the cod fishery. Comparisons were made between the amt. of mother fish (marketable cod) and the amt. of eggs (detd. by fishings with the Hensen net) on one side and the amt. of larvae on the other. Larvae were taken by 30-min. hauls with ring-trawls 2 m. in diam. It was shown that the amts. of spawning cod and eggs spawned had little effect upon the amt. of fry appearing. Broadly speaking the yrs. beginning and ending the period 1923-39 were good brood yrs. while the intermediate yrs. were rather poor brood yrs. A distinct positive correlation was found between the temp. of the lower water layers in April-May and the found amt. of cod larvae, high temps. coinciding with large amts. of larvae. A connection was also established between the amt. of larvae in April and May and the quantity of plankton in Jan., Feb. and March. Even at the larval stage the size of the stock of cod is already detd., and there is a clear connection between the fluctuations of the amt. of larvae and the yield of the fishery. By such investigations it is possible to forecast with a high degree of accuracy the possibilities of the cod fishery 2-4 yrs. later. Poulsen feels that the cod fishery is now so extensive that in periods with small occurrences of fry the stock is fished far beyond its power of maintaining its size, and that in the future greater attention should be paid to the protection of the stock of cod. The minimum size-limit of 275 mm. should be raised to about 320 mm. He also recommends the greatest possible care in the liberation of undersized cod caught in pound-nets and eel-weels.—H. H. Howell.

232. Rawson, D. S. (U. Sask., Saskatoon, Sask., Canada.) The experimental introduction of smallmouth black bass into lakes of the Prince Albert National Park, Saskatchewan. *Trans. Amer. Fish. Soc.* 73: 19-31. 1945.—Previous attempts to introduce smallmouth black bass (*Micropterus dolomieu*) into Saskatchewan lakes had failed, but the author's survey of Prince Albert Natl. Park in 1928 indicated a need for better game fish and some hope of establishing this species. Adult bass were brought from eastern Canada, confined in rearing enclosures screened off in protected bays and provided with artificial nests. Stocking began in 1936 and continued for 5 summers. 1,500 adults were transported and 260,000 fry reared. Investigation in 1942 showed that the adult bass had survived in fair numbers and were spawning in the Heart Lakes. No evidence was obtained that the fry released in the lakes had been reaching maturity. The abundance of piscivorous fish and the immature stage at which these fry were planted are suggested as factors contributing to a high mortality. The larger and deeper lakes in this region, such as Waskesin, appear to be marginal as to temp. toleration of this species. Shallower waters, such as the Heart Lakes, may prove quite suitable for smallmouth bass. Natural screened enclosures, introduced by the author in 1936, have been successful in rearing fry but losses of eggs and fry resulting from falling temps. occur in these enclosures as they do in ordinary rearing ponds. Feeding enclosures are desirable to avoid planting fry in an immature stage.—D. S. Rawson.

233. Ricker, William E. (Indiana U., Bloomington.) Causes of death among Indiana fishes. *Trans. North Amer. Wildlife Conf.* 10: 266-269. 1945.—Among several lake fishes natural mortality was found to be more important than fishing as a cause of death of legal-sized fish. Predation seemed inadequate to account for any considerable part of these deaths. Relaxation of fishing regulations would permit the utilization of a larger part of the stock, but the effect of such a move upon reproduction should be determined by experiment.—R. E. Ricker.

234. Ricker, William E. (Indiana U., Bloomington), Harrell F. Mosbaugh, and Maurice Lung. (Dept. Conserv., Indianapolis, Ind.) Production of Indiana hatcheries in 1942. *Trans. Amer. Fish. Soc.* 73: 373-376. 1945.—Live wts. of fish produced in 3 hatcheries of central and northern Indiana were about 75 lb. per acre of largemouth and small-

mouth black bass, 105 lb. of spotted or Kentucky bass, and 210 lb. of bluegills and redear sunfish. An exptl. pond of year-old bluegills and redear sunfish increased in wt. by 366 lb. per acre. The total annual production of warm-water fish for stocking in Indiana is estimated as about 16 tons.—*Authors.*

235. Rounsefell, George A. (*U. S. Fish and Wildlife Serv., Washington, D. C.*), and John Lawrence Kask. *How to mark fish.* *Trans. Amer. Fish. Soc.* 73: 320-363. 1945.—The records of the tagging of 462,000 marine and anadromous fishes from 1873 to 1933 are summarized by species and locality. An effort has been made to clear up the confusion in the names and descriptions of tags by classifying all the tags actually used into 13 categories which are defined. An illustration is given of one or more tags in each category. The origin, use, and development is discussed for each tag, accompanied by an accurate description of size, shape and material. How to plan a tagging expt. so as to yield the type of information desired is discussed at length. Methods are given for recovering tags from the liberated fish by advertising, canvassing, direct observation, payment of rewards and mechanical sorters. The need for the use of proper field methods is stressed in expts. designed to show the relative efficiency of different tags. Drawing to a large extent on personal experience the actual field technique employed is discussed at length. A bibliography of 232 references contains all the important papers on tagging to within recent yrs. and provides the basis for the tabulations of numbers and species of fish tagged, and gives the original description of each tag.—*G. A. Rounsefell.*

236. Rounsefell, George A., and Louis D. Stringer. (*U. S. Fish and Wildlife Serv., Washington, D. C.*) *Restoration and management of the New England Alewife fisheries with special reference to Maine.* *Trans. Amer. Fish. Soc.* 73: 394-424. 1945.—To augment the fish supply in New England, increased attention is being accorded to the alewife. Through neglect, obstructions to migration, over-fishing, and other causes, the alewife populations have been reduced greatly. A survey of the coastal streams of Maine disclosed many streams that can be returned to production by building fishways or modifying present fishways, in conjunction with a program of restocking and proper management methods. During the 1943 season, barren spawning area (lakes) on 13 streams were stocked with alewives and observations indicated successful production and survival of young. Recommendations are made for the removal of obstructions or the construction of fishways on 17 streams.—*G. A. Rounsefell.*

237. Schuck, Howard A. (*New York State Conserv. Dept., Albany.*) *Survival, population density, growth, and movement of the wild brown trout in Crystal Creek.* *Trans. Amer. Fish. Soc.* 73: 209-230. 1945.—An annual (Sept.) inventory of 13 sample sections of Crystal Creek, N.Y.S., by means of electrically shocking showed the % of survival of wild brown trout (*Salmo fario*) young of the year (fingerlings) to be 24.1% to 1 yr. old, 11% to 2 yrs. old, 5.49% to 3 yrs. old, 1.25% to 4 yrs. old, and 0.48% to 5 yrs. old. These trout were subject to angling which annually removed about 15% of the fish above 7 inches. Hatchery fingerlings planted in Sept. survived to the following Sept. at rates varying from 0.25% to 6.3%. The numbers of wild legal-sized trout present influenced the catch by anglers, for with 526 present in 1939, 0.275 per hr. were taken, as compared to catches of 0.192 in 1940 with 424 present and 0.088 per hr. in 1941 with 245 present. In the average yr., 28.5% of the 2-yr.-old fish present were caught by anglers, 22.6% of the 3-yr.-olds, 12% of the 4-yr.-olds and only 8.83% of the 5-yr.-olds. There were estimated to be 1,053 wild trout per mile of fast water and only 481 per mile of slow water. Trout under 8.4 inches were more numerous in fast water, but those 8.4 inches and larger were more numerous in slow water. On a per mile basis there were 421 fingerlings, 106 yearlings, 48.6 2-yr.-olds, 31.1 3-yr.-olds, 11.2 4-yr.-olds and 5 5-yr.-old fish. The av. length of fingerlings in fast water (3.24 inches) was significantly greater than the av. of 2.92 inches for those caught in slow water areas.—*H. A. Schuck.*

238. Shetter, David S. (*Box 5, Lewiston, Mich.*), and Austin W. Leonard. *A population study of a limited area in a Michigan trout stream, September, 1940.* *Trans. Amer. Fish. Soc.* 72: 35-51. 1943.—A population study of 580.5 feet (0.131 acres) of Hunt Creek in Montmorency Co.,

Michigan, was conducted in Sept., 1940, by means of stream diversion, blocking and seining, and finally by poisoning to obtain the complete population. Calculations based on the areal measurements and the numbers of fish captured indicated the standing crop per acre of stream to be 4,619 brook trout (*Salvelinus f. fontinalis*) weighing 94.4 lb., and 1,435 muddlers (*Cottus b. bairdii*) weighing 9.68 lb. Only 2.3% of the brook trout were larger than legal size of 7 in., total length. Seining as a method of capture was proven to be not more than 80% efficient. From scale studies on the brook trout collected, it was demonstrated that the legal size of 7 in. was not reached until the 3d or 4th summer of life. The distribution of the age-groups among the brook trout population was found to be as follows: O—46.7%; I—30.8%; II—19.8%; III—2.7%. The survival from one age-group to the next from 1,000 young-of-the-year brook trout was calculated to be as follows: O—1,000; I—659; II—424; III—58; and only 54 reach legal size. The average coeff. of condition (K) of the brook trout was determined to be 1.469 for fish of the size range 4-9 $\frac{1}{2}$  inches, which was somewhat higher than found by other investigators.—*D. S. Shetter.*

239. Siegler, Hilbert R., and H. W. Pillsbury. (*New Hampshire Fish and Game Dept., Concord.*) *Use of derris to reclaim ponds for game fish.* *Jour. Wildlife Management* 10(4): 308-316. 1946.—Lakes up to several hundred acres in area can be reclaimed satisfactorily for game fish with rotenone. The following factors should be considered when poisoning operations are contemplated: accessibility of water to be reclaimed, water sources, outlet, water temp. (or time of yr.), depth and vol. of water, rotenone content of derris, and research possibilities. Unless all head waters and marshy shore areas can be covered entirely, there is little probability of a complete kill. No water should be poisoned that cannot be held for a minimum of 3 weeks before overflowing. Rotenone will kill the fish population of a lake with water temp. as low as 48°F; however, the colder the water, the more slowly the poison becomes dissipated. Lakes poisoned late in autumn may remain toxic to fish until the seasonal turn-over of water in spring. Of 7 ponds poisoned, 2 could be restocked within 35 days but 2 others remained toxic to fish all winter. Water vol. calculations to the nearest acre-foot are accurate enough for all practical purposes in poisoning operations. Concs. of 0.153 to 2 ppm. of derris powder to water vol. have been used with success in New Hampshire. Spraying is the most satisfactory method of application. The cost of reclamation operations on 7 lakes in N.H. averaged \$1.41 per acre-foot and varied from \$0.78 to \$4.75.—*H. R. Siegler.*

240. Smith, Charles G., and Lawrence F. Miller. *A comparison of the hoop-net catch on several waters in the Tennessee Valley before and after impoundment.* *Trans. Amer. Fish. Soc.* 72: 212-219. 1943.—Identical hoop nets were set in 2 pre-impoundment areas and in one reservoir in the Tennessee Valley to note differences in the relative abundance of fish before and after impoundment. In one pre-impoundment area (Holston River), 107 net lifts yielded 321 fish (300 fish per 100 lifts); in the other pre-impoundment area (Tennessee River), 583 fish were taken in 148 net lifts (394 fish per 100 lifts). The 4 major habitats in Wheeler Reservoir yielded 17,087, 877, 1,590, and 947 fish, respectively, per 100 lifts. Fish are evidently much more abundant in the reservoir than in the several pre-impoundment areas.—*Authors.*

241. Smith, E. V., and H. S. Swingle. *Percentages of survival of bluegills (*Lepomis macrochirus*) and largemouth black bass (*Huro salmoides*) when planted in new ponds.* *Trans. Amer. Fish. Soc.* 72: 63-67. 1943.—In contrast to the low % of survival to be expected when bluegills and largemouth black bass are planted in streams and old lakes, high percentages are obtained when these fish are planted in new ponds. Survivals of 75-100% were obtained when bluegill fingerlings alone were planted in ponds in which food was plentiful. In bluegill-bass combinations, survivals of 76-85% were obtained for bluegill fingerlings. Percentages of survival for largemouth black bass in bluegill-bass combinations were 75 for fingerlings and 80-90 for advanced fry. Recognition of the high survivals of these spp. forms one of the bases for an intelligent stocking program for new ponds.—*Authors.*

242. Smith, E. V., and H. S. Swingle. *Organic ma-*

terials as fertilizers for fish ponds. *Trans. Amer. Fish. Soc.* 72: 97-102. 1943.—The production of fish in ponds can be increased by the use of organic fertilizers such as cottonseed meal and soybean meal, and productivity can be further increased by addition of superphosphate to these meals. From the standpoint of fish production alone, such organic materials are worthy of consideration as fertilizers for fish ponds. There are certain limitations to the use of both cottonseed meal and soybean meal, alone or in combination with superphosphate, however. In expts., dense growths of filamentous algae developed in ponds fertilized with the above materials. Excessive amts. of filamentous algae are objectionable in ponds; they interfere with fishing and harbor mosquito larvae and pupae. In addition, although cottonseed meal stains water brown, ponds fertilized with this material are usually too clear for best fishing. Some means must be found for overcoming the objectionable features of organic fertilizers before they can be generally recommended for use in ponds, even though they do increase productivity.—*Authors.*

243. Smith, Lloyd L. Jr., and John B. Moyle. (Minnesota Dept. Conserv., St. Paul.) Factors influencing production of yellow pikeperch, *Stizostedion vitreum vitreum*, in Minnesota rearing ponds. *Trans. Amer. Fish. Soc.* 73: 243-261. 1945.—Stomach analyses of 947 yellow pikeperch fingerlings taken from rearing ponds show that fry begin feeding on rotifers and nauplii, and that as the fish increase in size Entomostraca, insects, and fish successively become important items in the diet. Yield and management data from 185 ponds suggest that the best means of controlling cannibalism and increasing yields are: fertilization to promote an early and sustained crustacean crop; use of forage fish as a food and "buffer population"; and harvesting at a wt. of 50 to 80 fingerlings to the pound. The av. yield per acre of yellow pikeperch from ponds in Minnesota for the period 1940-1943 was 48.4 lb. and 2,111 fingerlings. The av. yields in pounds per acre attained in yellow pikeperch ponds under different management methods varied from 7.5 to 95.8. Few ponds succeeded that had a game-fish or minnow population when fry were stocked. Data from 10 exptl. ponds demonstrate that the most effective types of fertilizer are commercial fertilizer and sheep manure. Cottonseed meal and superphosphate were found to be relatively ineffective.—*L. L. Smith, Jr.*

244. Smith, Lloyd L., and Beatrice S. Smith. (Minnesota Dept. Conserv., St. Paul.) Survival of 7- to 10-inch planted trout in two Minnesota streams. *Trans. Amer. Fish. Soc.* 73: 108-116. 1945.—Jaw-tagged 7- to 10-inch brook trout and brown trout were placed in 2 Minnesota streams to determine survival. Of brown trout planted in Duschee Creek in the fall and spring, 21.7% and 28%, respectively, were caught during the succeeding open season. Planted trout contributed 8.8% and 22.7% of total catch in successive seasons. Of brown and brook trout planted in Knife River in fall and spring, a total return of 1.9% from fall planting and 14.1% from spring planting was realized in the succeeding open season. The contribution of planted fish to the catch in Knife River was 23%. The studies indicate that in streams such as Duschee Creek, fall-planted brown trout may have survival comparable to that of spring-planted fish but the majority of planted fish recovered are taken the first 3-4 weeks of the open season, and that planted fish contribute only a minor portion of the total catch.—*L. L. Smith, Jr.*

245. Surber, Eugene W. Observations on the natural and artificial propagation of the smallmouth black bass, *Micropterus dolomieu*. *Trans. Amer. Fish. Soc.* 72: 233-245. 1943.—Counts of smallmouth black bass nests in the same sections of the South Branch of the Potomac, the Cacapon, and the Shenandoah Rivers are reported over a period of several seasons. The 4-yr. record for the S. Branch of the Potomac indicates little change in the smallmouth black bass population. The number of nests varied between 50.7 and 73.2 and averaged 58.1 for each mile of stream. The results of fry counts from wild nests showed an average of 2,159 fry in each nest in the S. Branch of the Potomac, 2,210 in the Cacapon R., and 1,998 in the Shenandoah R. One important characteristic of natural propagation in these rivers is the simultaneous occurrence of spawning in any section of stream having similar conditions. Evidence is

supplied to support the theory that a long-drawn-out spawning season in artificial ponds is due to annoyance of the brood fish. The importance of attendance by the ♂ fish at the nest is pointed out. Examples in pond culture are given to demonstrate that there are other factors involved in the spawning of smallmouth black bass besides temp. These factors are annoyance, over-crowding of the brood fish, and lack of provision for greater individual privacy among the brood bass during their spawning season. In general, productivity of fry apparently increases with age and size of the brood fish.—*E. W. Surber.*

246. Surber, Eugene W. (U. S. Fish and Wildlife Serv., Kearneysville, W. Va.) The effects of various fertilizers on plant growths and their probable influence on the production of smallmouth black bass in hard-water ponds. *Trans. Amer. Fish. Soc.* 73: 377-393. 5 fig. 1945.—Production of *Micropterus dolomieu* in unfertilized ponds averaged 57 lb. per acre in an average growing season of 106 days. Dense growths of *Chara* which cover the pond bottoms in these lime-rich waters are held responsible for low production. Fertilization with cottonseed and soybean meals failed to increase production. *Chara* predominated in these fertilized ponds, also. Their surfaces remained free of pond scum algae. The combination of sheep manure and superphosphate, in equal parts, produced thick scums of surface algae, principally *Hydrodictyon*, without increased fish production. Cottonseed meal and superphosphate produced surface scum algae, but these did not completely cover the surface, and greater fish production resulted (average, 97 lb. of bass per acre). Inorganic-fertilizer combinations fostered the growth of *Spirogyra*, *Cladophora glomerata*, and other filamentous algae, and these, in turn, served to hold the coarse vegetation such as *Chara*, *Potamogetons*, *Anacharis*, etc., under control. In some ponds with inorganic fertilizers, water blooms developed. Production of *M. dolomieu* in a 12-5-5 combination averaged 145 lb. per acre in an average season of 106 days. Highest producing series of ponds were those fertilized with timothy hay 10 parts and superphosphate 1 part in which an av. production of 189 lbs. of bass per acre in 112 days were obtained. High production characterized ponds with water blooms. The latter were produced artificially by killing the coarse vegetation with Na arsenite or  $\text{CuSO}_4$ .—*E. W. Surber.*

247. Swingle, H. S. (Alabama Agric. Expt. Sta., Auburn.) Improvement of fishing in old ponds. *Trans. North Amer. Wildlife Conf.* 10: 299-308. 1945.—Experiments dealing with the renovation of old ponds have been conducted in Alabama during the past 10 yrs. Expts. have demonstrated that, for the best fishing over the longest period of time, ponds in the Southeast must be stocked with both bluegill bream and largemouth black bass, but that additional spp. may be used if desired. If either bass or bluegills are not present in a pond, corrective restocking with that spp. should first be resorted to. For good fishing to result, the fish-feeding spp. (such as bass) and the insect-feeding spp. (such as bluegills and other forage fish) must be present in the proper balance. In ponds with unbalanced populations, relatively few bream and very few bass can be caught. Methods for the detn. of balanced or unbalanced conditions and the corrective measures necessary are discussed. Correction of an unbalanced condition in one pond resulted in a 90% increase in the catch. Fertilization to increase the food supply has been found to increase the fish-carrying capacity of Alabama ponds 300 to 400%. Because fertilization aids in weed control and increases the ease with which fish can be caught, the average catch over a 5-yr. period in a fertilized pond exceeded that in an unfertilized one by 879%. Weed control is one of the principal problems involved in the renovation of old ponds. Control of *Najas guadalupensis* in a pond, without materially changing its fish-carrying capacity, resulted in a 230% increase in the catch of fish. Pond fertilization should be used whenever possible in weed control because the resulting growth of plankton greatly retards or prevents the growth of weeds except in very shallow water. Yearly restocking for the improvement of fishing was of no value.—*H. S. Swingle.*

248. Tarzwell, Clarence M. (TVA, Decatur, Ala.) The possibilities of a commercial fishery in the TVA impoundments and its value in solving the sport and rough fish problems. *Trans. Amer. Fish. Soc.* 73: 137-157. 1945.—Increased prices and the scarcity of meat have created a much



greater demand for fishery products. Meeting this demand will require the fullest utilization of our fresh-water fishery resources because our marine fishery is partly inoperative due to war conditions. It is believed that the fishes produced in the TVA impoundments can make a significant contribution to the food-for-victory program. Investigations conducted on these impoundments during the past 5 yrs. indicate that they are rich in fish life and are capable of supporting an extensive fishery. Although all forms of netting are prohibited, there was an av. take of 25 lb. of fish per acre by sport and setline fishermen during 1940 in the 4 lower reservoirs: Guntersville, Wheeler, Wilson, and Pickwick. This rate of production greatly exceeds the av. yield of 1.8 lb. per acre from the Great Lakes. Fish population studies in the backwaters of Wheeler Reservoir suggest that much larger catches could be made if certain types of gear, such as seines, trap nets, and gill nets, were legalized. These studies revealed populations as high as 831 lb. per acre in waters only 2-3 ft. deep. The av. population per acre for all areas studied was 8,246 fish, weighing 576 lbs. Coarse fish were dominant in all the areas and comprised 82.5% of the total wt. taken, while game fish comprised only 3%, pan fish 9.6%, and food fish 4.9%. This predominance of the coarse species coupled with a decline of the game spp. indicates that the coarse fishes are increasing at the expense of the game spp. A commercial fishery in these waters would be valuable, therefore, not only for furnishing an estimated annual yield of 22 million lb. of fish for which there is a great need during the present emergency, but also for controlling the coarse spp. There are, however, several problems to be solved before a commercial fishery can be established in these reservoirs. Among these problems are the removal of legal restrictions on netting, the development of a market for the coarse spp., and the discovery of profitable methods for taking fish. It is hoped that legal restrictions on netting will be removed in the near future by legislative action of the States concerned. Due to the present emergency there is now a market for several of the coarse fishes, such as carp and buffalo, for which there is a very limited demand during normal times. Those spp., such as gar, shad, and mooneye, which are not in demand for food can be utilized along with the offal from the edible fish for the production of fish meal and oil. Expts. conducted to date indicate that their use in this manner is both practicable and profitable. Studies to determine the most feasible fishing methods indicate that fyke nets and gill nets are of limited value for the taking of coarse fish, except in certain localities and at certain times. Large-mesh gill nets are quite effective for several spp. and are especially good below the dams. Seines have to date given the best returns, but their use is restricted to areas free of stumps and other obstructions. While the problem is yet to be solved it is probable that if legal restrictions on netting are removed the fishermen will devise ways and means of taking fish. It is believed that through the use of several types of gear at different times, or for different spp., it will be possible to carry on a profitable commercial fishery in the TVA reservoirs. Such a fishery must be managed, however, so that the even less desirable species, such as gar, shad, and carpsuckers, do not become dominant in the event that carp and buffalo can be controlled.—C. M. Tarzwell.

249. Tarzwell, Clarence M., and Lawrence F. Miller. The measurement of fishing intensity on the lower TVA reservoirs. *Trans. Amer. Fish. Soc.* 72: 246-256. 1943.—In March 1940, an intensive inventory of fishing on the lower TVA reservoirs was undertaken to determine the extent and value of their fishery. Since only outboard motorboats were used in this census and since the four lower reservoirs have a combined shoreline of some 2,600 miles, it was necessary to divide them into sections which could be covered in one day and to develop sampling techniques for the study. At first, periodic sampling was used, but in August this method was abandoned in favor of stratified random sampling. During the period of the study 123 complete counts were made and a total of over 70,000 miles of shoreline were covered. On the basis of the counts made it was calculated that there were over 1,200,000 man-days of fishing on these reservoirs during the yr. of the study. About 162,000 man-days of this fishing were concentrated in the small tail-water areas of Guntersville, Wheeler, Wilson, and Pickwick Dams. Fishing was heaviest during Apr., May, and June, after

which it steadily declined to a new low in Dec. or Feb. Bank fishermen were predominant on the reservoirs proper but boat fishermen were dominant in the tail-water areas below the dams with the exception of Pickwick Dam. Of the 3 lower reservoirs, fishing was heaviest on Wheeler which had 6.4 fishermen-days per acre. Wilson ranked 2d with 4.9 fishermen-days, and Pickwick 3d with 3.3 fishermen-days per acre. The intensity of fishing per mile of shoreline varied from 566 fishermen-days on Wilson Reservoir to 311 on Pickwick Reservoir.—C. M. Tarzwell.

250. Trembley, G. L. (*Agric. Expt. Sta., State College, Pa.*) Results from plantings of tagged trout in Spring Creek, Pennsylvania. *Trans. Amer. Fish. Soc.* 73: 158-172. 2 fig. 1945.—A creel census in 1939 provided data on anglers' catches of tagged trout, the growth and migration of trout and the relative efficiency of fall and spring plantings. Of 2130 tagged trout planted, 50.8% were recovered by anglers. Of these > 40% were removed on the 1st day of the fishing season. 76% of the total recoveries of brook trout were made on the 1st day. The number of tagged trout surviving from one fishing season to the next was insignificant. Rainbow trout grew fastest, followed by brown trout and brook trout. Migrations of fall-planted trout were not extensive, averaging < 1 mile. Fall planting of the 3 spp. was nearly as efficient as spring planting as 49% of the former and 54% of the latter were recovered. Fall-planted trout were taken more readily in the early fishing season than were spring-planted trout.—G. L. Trembley.

251. Tryon, C. A. Jr. The effect of covering hatchery troughs on the growth of cutthroat trout (*Salmo clarkii*). *Trans. Amer. Fish. Soc.* 72: 145-149. 1 fig. 1943.—Cutthroat trout, when kept in open hatchery troughs, had a growth rate 13.8% greater, as measured by increase in wt., than when kept in covered troughs. The influence of the covers was consistent at 2 different densities of fish.—C. A. Tryon, Jr.

252. Various Authors. Fishery resources of the United States. Letter of the Secretary of the Interior transmitting pursuant to law, a report on a survey of the fishery resources of the United States and its possessions. iv+135p. 68 maps, 60 fig. United States Government Printing Office: Washington, 1945. Pr. \$.40.—The sober outside of this document does not prepare the reader for the lively hosts that cavort within. The volume is a truly graphic presentation—animated pictures of fish species, sketch maps of their distribution, drawings of vessels and equipment, graphs and tables of catch, processed products, good and bad water—utilization projects in relation to fish resources and so on. Included are a 2-page spread of a cross section of the Gulf of Maine showing distribution of ground fish by depth and type of bottom, the upstream spawning migration of the shad, and "making a set on a school of menhaden." The material is arranged regionally, beginning with the Pacific fisheries and the salmon and ending with the fresh-water fisheries and brook trout to burbot; resources of the Hawaiian Islands and Puerto Rico are briefly mentioned. Some world resources are considered where fished by U. S. fishermen; for example, tunas and whales, fur seals, turtles and frogs are included, and sponges and seaweed. The accompanying text is simple and concise. The table of contents gives scientific names and alternative common names.—L. A. Sandholzer.

253. Viosca, Percy Jr. Phenomenal growth rates of largemouth black bass in Louisiana waters. *Trans. Amer. Fish. Soc.* 72: 68-71. 1943.—Growth-rate studies which show that largemouth black bass [*Huro salmoides*] grow faster in the South than in the North are reported. Southern fish make their fastest growth in length during their 1st yr., northern fish during their 2d year. Fish in virgin waters grow faster than fish in more mature waters. A specimen taken from a newly dug borrow-pit in Louisiana grew at the av. rate of 2.5 oz. per month. The rates of growth of various fast-growing individuals reared in captivity at the Louisiana fisheries stations as well as some northern records are given. The largest increment in a first-yr. Louisiana fish was 7 oz. per month during a 4-month period and in a 2d-yr. fish, 8 oz. per month during a 7-month period.—Percy Viosca, Jr.

254. Viosca, Percy Jr. A critical analysis of practices in the management of warm-water fish with a view to greater food production. *Trans. Amer. Fish. Soc.* 73: 274-283. 1945.—An analysis is made of the commonly used practices

in the management of warm-water fish. These practices consist chiefly of legal restrictions, such as closed seasons and creel and size limits, and the restocking of waters from hatcheries or with fish obtained in so-called rescue operations. The value of most of such practices seems to be nil when considered in terms of satisfaction to the angler or increased food production. Some supporting evidence is presented. Suggestions for increasing fish production are: The harvesting of fish crops in proportion to species and sizes available; the rejuvenation of senescent lakes by irrigation; the impoundment of new water areas with provision for managing and harvesting the whole crop; and the utilization of abandoned reclamation projects in a similar manner. The judicious use of irrigation and drainage for the purpose of oxidizing pond bottoms, and the fluctuation of water-levels for reducing shore vegetation and thinning out overly dense populations, are also proposed.—Percy Viosca, Jr.

255. Warfel, Herbert E., Terrance P. Frost, and Warren H. Jones. The smelt, *Osmerus mordax*, in Great Bay, New Hampshire. *Trans. Amer. Fish. Soc.* 72: 257-262. 1 fig. 1943.—*O. mordax* is an important commercial fish in the coastal area of New Hampshire. Two methods are used for capture: 1) a bow net, is used for fishing through the ice; and 2) a trap net, called a weir, is set in streams near the bay. The age composition of the spawning population is composed of 4 age classes of which the 2-yr. and 3-yr. classes predominate. A few 1-yr. and 4-yr. fish are encountered. One-yr. fish average 86 mm. total length and 2.45 g. in wt.; 2-yr. fish average 144.9 mm. total length and 16.73 g. wt.; 3-yr. fish average 171 mm. total length and 30.62 g. wt.; and the 4-yr. individuals are about 220 mm. total length and 55 g. in weight. Sexual dimorphism is pronounced at the spawning season in that ♀♀ are larger, lighter colored, and have smaller nuptial tubercles. The sex ratio for the entire spawning population studied was 1, but early and late in the run ♀♀ predominate. In the middle of the spawning run ♂♂ are more plentiful.—Authors.

256. Webster, Dwight A. (Cornell U., Ithaca, N. Y.) Food progression in young white perch *Morone americana* (Gmelin) from Bantam Lake, Connecticut. *Trans. Amer. Fish. Soc.* 72: 136-144. 3 fig. 1943.—On Aug. 26 and 27, 1941, collections of young white perch were made at 8:30 and 11:30 p.m. and at 2:30 and 4:30 a.m. when the fish had moved over shoals. The stomach and intestinal contents of 50 specimens in each collection were examined; estimates were made of the fullness of the stomachs and of the volume of the various food organisms. The position of the food was diagrammatically noted. The stomachs examined from the 8:30 p.m. collection held considerable food, but those from subsequent ones held increasingly less, until the 4:30 a.m. collection, when about 95% of the fish examined had empty stomachs. The most important food organisms in the 8:30 p.m. collection were Cladocera, chironomid larvae, and a certain adult of the Hymenoptera. In the following collections, the volume of Cladocera gradually decreased in the digestive tract and such forms as *Hyalella*, and adults, midge pupae, and mayfly nymphs increased greatly. In the several collections there was a marked tendency for the important food organisms to occupy a similar position in the digestive tract of all fish in the same collection. A well-defined progression of the main food organisms could be followed through the digestive tract from the initial collection to the last.—D. A. Webster.

257. Williamson, Lyman O., and Edward Schneberger. The results of planting legal-sized trout in the Deerskin River, Vilas County, Wisconsin. *Trans. Amer. Fish. Soc.* 72: 92-96. 1943.—A creel census was conducted on the Deerskin River to determine the results of stocking trout of legal size. The stocking was done in Dec. and May and consisted of 1,002 brook and 1,621 rainbow trout. A yield of 3,438 trout was obtained. Native fish made up 71% of the catch. Native brook trout supplied the most fishing (50.5% of the total). All stocked fish, especially the larger rainbow planted in Dec., were inferior in condition and sporting value. There were no reports of either species carrying over to the 2d season.—Edward Schneberger.

258. Woodbury, L. A. Vitamin B<sub>1</sub> deficiency in hatchery reared rainbow trout. *Trans. Amer. Fish. Soc.* 72: 30-34. 1943.—A nutritional disease of trout, caused by a diet deficient in Vitamin B<sub>1</sub> (thiamin), is described. The symp-

toms are attributable, either primarily or secondarily, to malfunctioning of the nervous system and are: Loss of equilibrium accompanied by whirling, melanotic appearance, inability to feed in the latter stages of the disease, progressive weakness, and a final paralysis. It was produced in the laboratory by feeding a diet known to be lacking in thiamin. The disease was cured by injns. of thiamine hydrochloride.—L. A. Woodbury.

259. Wright, Stillman. (Utah State Agric. Coll., Logan.) The effect of moonlight on fishing success in Fish Lake, Utah. *Trans. Amer. Fish. Soc.* 73: 52-58. 1945.—Partial creel-census records of Fish Lake, Utah, for the seasons of 1941-1943, were analyzed for evidence of a relationship between moonlight and fishing success. For both trolling and fly-fishing, the difference in the catch at times of new and full moons was not significant. The fly-fishing catch at times of first quarter moons (1.69 fish per man-trip) was significantly less than the mean catch at times of adjacent new and full moons (3.87 fish per man-trip); mean difference,  $2.19 \pm 0.675$ ; value of  $t$ , 3.244. It is probable that light is the essential factor in producing the observed effect on fly-fishing at times of first quarter moon. This type of fishing is done almost exclusively after dark. A high ridge on the east shore of the lake protects the fishing area from the light of the full moon during effective fishing time, but the area is exposed to the light of the first quarter moon. Suggested explanations for the mode of operation of moonlight in reducing the catch are discussed.—Stillman Wright.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 15, 163, 169, 170, 2459)

260. Barick, Frank B. (New York State Coll. Forest., Syracuse.) Environmental analysis of forest edges in relation to wildlife. *Trans. North Amer. Wildlife Conf.* 10: 126-136. 2 fig. 1945.—Edges between 10 different forest types in the Adirondack Mts. were studied and intensive methods of graphical and statistical presentation of the relative abundance of the various plant spp. across the edge are described. By these methods one can determine with relatively great accuracy the amts. of each species of vegetative food and/or cover in any type of vegetation. A method of converting data from a graphical form to a statistical form is presented. The importance of detailed investigations of this type as a background for wild life management problems is stressed.—F. B. Barick.

261. Baumgartner, F. M. (Oklahoma Agric. and Mech. Coll., Stillwater.) Management of bob-white on the oak-tall grass prairie, north central Oklahoma. *Trans. North Amer. Wildlife Conf.* 10: 185-190. 1945.—Field studies on the ecology and management of *Colinus virginianus* indicated that overgrazing reduced fall populations and frequently eliminated winter ranges. Fall and early winter fires destroyed ranges and later winter fires reduced the carrying capacity the following winter. Winter feeding carried coveys through on areas deficient in natural foods. Post lot plantings of black locust (*Robinia pseudoacacia*) and plantings of ornamental trees and shrubs about farm homes provided satisfactory winter range. Normal hunting left a surplus of birds above the number that could survive the winter.—F. M. Baumgartner.

262. Bishop, James S. (State Bd. Fish. and Game, Hartford, Conn.), and George P. Spinner. (U. S. Fish and Wildlife Serv., Smyrna, Del.) Quantities of weed seed produced in Connecticut cornfields. *Jour. Wildlife Management* 10(4): 300-303. 1946.—The weed stems on 10 mechanically located plots in each of 20 fields were counted at harvest. Weight of seed produced was calculated from that av. wt. of seed on 100 stems of each sp., selected at random. The av. wt. of seed per stem varied from 0.07 gram for *Digitaria sanguinalis* to 2.8 gm. for *Ambrosia artemisiifolia*. *Setaria glauca* produced the greatest number of stems per milacre plot, 526. *A. artemisiifolia*, which produced  $> 1/2$  of the total wt. of seed, was most important, with *Chenopodium album*, *Polygonum pennsylvanicum* and *S. glauca* valuable. Plots on edges of the fields contained more spp. of weeds, stems per plot, and wt. of seed than those further in, hence small fields were more productive on a per acre basis. The effects of field edges on the occurrence and seed production of 8 spp. of weeds are noted. Weed seed production showed an increase with fertility and on fields in corn the preceding yr. No correlation was found between production and section of

the state, or kind, amt., or last date of cultivation. Land use subsequent to harvest, the cover on and adjacent to the field, and availability of certain weed seeds to pheasants rather than the amount of food produced probably determine the value of cornfields to the birds.—J. S. Bishop.

263. Bond, Richard M. (Soil Conserv. Serv., Portland, Ore.) Range rodents and plant succession. *Trans. North Amer. Wildlife Conf.* 10: 229-234. 1945.—The range rodents (*Cynomys*, *Citellus*, *Geomys*, *Thomomys*, *Dipodomys*, *Perognathus*, and *Neotoma*) prefer as food, plants early in the successional scale. Under some circumstances the rodents may speed up plant succession by lessening competition between the climax perennial grasses. Jack rabbits (*Lepus*) eat about equal parts of weeds and grass and thus may improve a slightly weedy range, but prevent recovery of a badly deteriorated one. Evidence presented is mostly from studies on other phases of range management, and specific tests of the hypothesis are needed.—R. M. Bond.

264. Burroughs, R. D. (Michigan Dept. Conserv., Lansing.) Game refuges and public hunting grounds in Michigan. *Jour. Wildlife Management* 10(4): 285-296. 1 fig. 1946.—The first state-owned big game refuge in Michigan was established in 1916; by 1924, 8 refuges totalling 47,396 acres had been established; by 1934, 12 "standard" refuges were in operation which involved 86,244 acres of land closed to hunting and 137,547 acres of surrounding public hunting grounds; by 1938 one refuge unit had been dropped reducing the area of closed land to 78,996 acres; and by 1944 the area of refuge had decreased to 37,098 acres, but during this period the area of northern wild land dedicated to public hunting increased to 1,151,966 acres. The shift in emphasis from refuge to public hunting grounds followed the increase in the deer population to where over-browsing was of major concern in many winter yarding areas. The Dept. of Conservation expended considerable effort on deeryard surveys and range mgt. studies including research on nutritional value of browse plants; amt. of available browse per acre in winter yards; practicability of controlled burning and release cutting in range mgt. Since 1938, Federal Aid in Wildlife Restoration funds have been utilized to acquire submarginal lands for game mgt. and public hunting in southern Michigan, and by 1945 a total of 64,417 acres had been acquired through purchase and tax reversion. Emphasis in these areas is being placed on food and cover mgt. rather than on complete protection, but refuge units are not excluded where deemed essential.—R. D. Burroughs.

265. Callison, Charles H. (Missouri Conserv. Comm., Jefferson City.) The real value of wildlife. *Missouri Conservationist* 6(11): 1, 10-11. 3 fig. 1945.—One of the public discoveries of the war was the essential role of wild creatures and the outdoors to the health and morale of the nation. It is with this in mind that wildlife resources must be managed today and in the future. A survey made in 1945 by the Dayton (Ohio) Journal-Herald disclosed that while 9,000 persons watched the Cincinnati Reds play baseball, 90,000 were fishing in neighboring Indian Lake. An American Legion poll of returning servicemen revealed that 70 of every 100 wanted to hunt; 62 listed fishing next. On the economic aspect, Nation's Business predicts a yearly post-war hunting and fishing trade up to three billion dollars; Outdoor Life surveys indicate a figure above four billion. The real value of wildlife, however, is in the immeasurable recreation and pleasure afforded to millions of Americans, including those who neither hunt nor fish.—W. O. Nagel.

266. Cartwright, B. W. (Ducks Unlimited (Canada), Winnipeg, Man., Canada.) Some results of waterfowl banding in western Canada by Ducks Unlimited (Canada). *Trans. North Amer. Wildlife Conf.* 10: 332-338. 2 maps. 1945.—Ducks banded by Ducks Unlimited (Canada) totalled 31,911 in the period 1938 to Dec. 31, 1944. Recoveries totalled 2,202 (6.9%). Of species banded in significant numbers, the Redhead (1217 banded, 170 recoveries), revealed heaviest hunting pressure, 14%. Of 40 recoveries in subsequent yrs., at or near the place originally banded, 25 were ♀♀, 8 ♂♂ and 7 of unknown sex, suggesting that ♀♀ tend to return to the same breeding locality yr. after yr. 29 recoveries in Ontario, Maine and New York State suggest a migration route through eastern Canada—not previously recognized. 127 recoveries in California reveal a previously unknown migration route from Western Canada (chiefly

Alberta) to the Pacific Coast. 41 recoveries in same year as banded show a post breeding northward movement from the prairies in which adults and juveniles of both sexes take part.—B. W. Cartwright.

267. Couey, Faye M. (Montana State Fish and Game Dept., Helena.) Antelope foods in southeastern Montana. *Jour. Wildlife Management* 10(4): 367. 1946.—Stomach samples taken during fall hunting seasons from 24 antelope (*Antilocapra americana*) were analyzed. Methods used are given and a table lists species eaten, frequency, and percentage. Principal foods were browse (87.4%) consisting of *Artemisia* (51%), *Gutierrezia* (14.3%) and *Symphoricarpos* (10.3%). Grasses (6.0%) occurred as traces or in very small amts. in 21 stomachs. Weeds constituted 5.7%.—F. M. Couey.

268. Davison, Verne E. (Soil Conserv. Serv., Spartanburg, S. C.) False principles delay advancement in wildlife techniques. *Jour. Wildlife Management* 10(4): 296-299. 1946.—After 10 yrs. bobwhite quail eat sericea lespedeza only sparingly, yet took readily to bicolor lespedeza on short experience with the latter. Reluctance may indicate a poor food, insufficient amt., or inadequate cover nearby. "Edge" in game cover is only a phenomenon of good range at times and for a few spp. of animals. More often the interspersing of food areas is a determining factor.—T. J. Storer.

269. Denmead, T. (U. S. Fish and Wildlife Serv., Washington, D. C.) Importations of live birds and animals. *All-Pets Mag.* 16(14): 13, 18-19. 1945.—A résumé of information on Federal and State regulations.—W. F. Hollander.

270. Edge, Rosalie. Conservation for victory. *New York Emergency Conservation Comm. Ann. Rept.* 1942: 1-26. 1 fig. 1943.—Reports on tree and bird spp. in danger of population reduction. The attitude of the National Audubon Society is severely criticized.

271. Edge, Rosalie. Conservation in action. The necessity for conservation organization. *New York Emergency Conservation Comm. Ann. Rept.* 1943: 1-22. 2 maps, 4 fig. 1944.—Reports on the conservation status of the South Calaveras Grove in California, the trumpeter swan, the Jackson Hole National Monument, the Olympic Forests, the Porcupine Mountains Forest, and various spp. of waterfowl, especially the wood duck, with criticisms of the National Audubon Society.

272. Einarsen, Arthur S. The importance of weather data in wildlife management. *Murrelet* 27(2): 29-33. 2 fig. 1946.—Periodic extremes of weather constitute a controlling factor in wildlife management, as illustrated by pink salmon (*Oncorhynchus gorbuscha*), pheasant [*Phasianus colchicus*], deer [*Odocoileus h. columbianus*], and forage-plant-control-plot catastrophes in the northwest. The need for detailed, local data is pointed out.—J. W. Slipp.

273. Enders, Robert K. (Swarthmore Coll., Pa.) Research an important factor in seal management. *Trans. North Amer. Wildlife Conf.* 10: 92-94. 1945.—Studies of the reproductive tracts from 500 seals (*Callorhinus alascanus*), many of known age, revealed that ♀♀ usually breed first when 2 yrs. old and bear their pup the following summer. ♂♂ apparently do not mature so rapidly. One pup comprises a litter. Ova are matured in alternate yrs. in each ovary.—G. A. Petrides.

274. Fearnow, Theodore C. (U. S. Forest Serv., Philadelphia, Pa.) Forest wildlife and national forest land management practices. *Trans. North Amer. Wildlife Conf.* 10: 104-111. 1945.—National Forest areas, occupying approx. 10% of the U. S. land area, provide important game and fish habitats. Forests in the densely populated Eastern Region have adopted special practices, working in cooperation with States, to improve wildlife habitats. Old fields are being retained as permanent clearings to increase edge effect. Clearings of one acre or less have been developed on a "checker board" pattern at intervals of approx. 1/2 mile, to increase forest-edge environment and to encourage grasses and herbaceous growth. *Dactylis glomerata* has been found well suited for sod formation on forest openings because of its tendency to remain green most of the year. Commercial timber sales are an effective means for obtaining favorable interspersing of forest cover on a large scale, and district rangers are taking an active part in coordinating timber sales and other land uses with wildlife needs. The regional



nursery is now producing seedlings of *Diospyros virginiana*, *Ilex verticillata*, *Prunus americana*, *Crataegus* spp., and *Viburnum* spp. for wildlife food plantings. Coniferous species are being planted in clump formations to improve wildlife cover. Deer have generally shown a favorable response to habitat management and grouse have responded locally. Wild turkey restoration efforts are not far enough advanced to provide conclusive data. Public support for the new program has been excellent. Eastern National Forests are gradually creating wildlife management units of approx. 25,000 acres with resident managers in charge and with state game commissions and National Forests working cooperatively. Forest Service participation is directed primarily to habitat management and improvement. States assume primary responsibility for law enforcement. Both agencies collaborate in working out plans for harvesting game and fish. In Virginia the program is financed primarily by a fee of \$1.00 per hunter and annual receipts from permits have increased from \$12,000 to more than \$25,000 in a 6-yr. period. Efforts to date indicate a promising field for cooperative development of public hunting and fishing opportunities on National Forests.—T. C. Fearnow.

275. Fish and Game Commission. Thirty-seventh biennial report of the Division of Fish and Game for the years 1940-1942. *California Dept. Nat. Resources Div. Fish and Game Rept.* 37. 1-124. 8 maps, 5 fig. 1942.—This report covers the activities of the various bureaus, and includes, among others, statistical reports on fish distribution, predatory animal kill, and game bird and mammal kill.

276. Glazener, W. C. (*Texas Game, Fish and Oyster Comm., Austin.*) Food habits of wild geese on the Gulf Coast of Texas. *Jour. Wildlife Management* 10(4): 322-329. 1 fig. 1946.—Material presented herein was gathered during the period from 1939 to 1945, over the entire coastal area. Here, up to 60 miles inland, where cattle grazing is the principal land use, more than 300,000 geese winter each year. Spp. included are the lesser snow goose (*Chen h. hyperborea*), blue goose (*C. caerulescens*), white-fronted goose (*Anser a. albifrons*), Canada goose (*Branta c. canadensis*), lesser Canada goose (*B. c. leucopareia*) and Hutchins goose (*B. c. hutchinsi*). Food studies were based jointly on analysis of materials from 117 goose gizzards, and on extensive field observations throughout the designated period. Cultivated rice (*Oryza sativa*) and corn (*Zea mays*) were the principal cultivated crops utilized by geese, most of the grain eaten being waste left in the fields. Geese fed largely on the foliage and seeds of such native spp. as occurred in each locality, and availability apparently influenced utilization as much as any preference. 31 native spp. were found in gizzard contents examined, and those taken most extensively were saltgrass (*Distichlis spicata*), water cress (*Radicula nasturtium-aquaticum*), water hyssop (*Bacopa monniera*), Bermuda grass (*Cynodon dactylon*), bur clover (*Medicago hispida*), sacahuiste (*Spartina spartinae*), and panic grass (*Panicum*).—W. C. Glazener.

277. Hamilton, William J. Jr. (*Cornell U., Ithaca, N. Y.*), and David B. Cook. (*Conserv. Dept., Albany, N. Y.*) Small mammals and the forest. *Trans. North Amer. Wildlife Conf.* 10: 137-139. 1945.—The small mammals are numerous, active, and important elements in the biology of the forest. Certain of their acts—notably the eating of tree and shrub seeds—are often considered detrimental to the forest but plants produce seed so lavishly that even a heavy loss may not be critical. In the process of digging burrows and searching for food, they stir up, mix and loosen the soil. They form a considerable portion of the food of hawks, owls and some of the fur bearers and act as buffers to protect more useful and valuable game birds and animals. They exercise a potent and ever-present check on forest insects and other invertebrates. Without small mammals, our forests would be less productive, more subject to insect epidemics, and certainly less interesting and enjoyable places.—D. B. Cook.

278. Harris, Dave (*S. Dakota Dept. Game Fish and Parks, Deadwood*), and Shaler E. Aldous. (*U. S. Fish and Wildlife Serv., St. Paul, Minn.*) Beaver management in the northern Black Hills of South Dakota. *Jour. Wildlife Management* 10(4): 353. 1 pl. 1946.—Beavers can be successfully transplanted by constructing a temporary house and dam for them in a selected location. Planting at sites where no temporary house and dam are prepd. usually results

in the beavers moving away or even returning to their original home, as proved by records of tagged beaver. Major benefits derived from proper beaver propagation consist of the maintenance of water conservation, water for wildlife and stock, a fish pond, and a fur producing unit.—D. Harris.

279. Haskell, E. S. Livestock and big game on National forests. *Nation. Wool Grower* 36(8): 12-13, 52. 1946.—The numbers of cattle, sheep, deer and elk grazing on the national forests in the 11 western states in 1921 and 1944 are compared. The tables show that as the numbers and use, in terms of animal unit months, decreased for cattle and sheep, they increased for deer and elk. This is not a direct cause and effect, for there is seemingly more competition within spp. than between spp., except in localized areas.—C. T. Blunn.

280. Herbert, Paul A. (*Michigan State Coll., East Lansing.*) Observations on the incompatibility of wood and game production. *Trans. North Amer. Wildlife Conf.* 10: 119-125. 1945.—A large percentage of private owners of forest land are interested primarily in wood production and many others while interested in game also still expect wood sales to cover taxes and other expenses. Furthermore, government control of the management of private forests is predicated on wood not game production. A farm woodland in the Central Hardware Region managed for wood production by the usual selection method will support very little wildlife. A 10- to 20-feet-wide strip around the edge of the woodlot furnishes shelter and a little food but the importance of this fringe for wildlife production is dependent largely upon the character of the adjacent fields. To support ground birds and mammals a farm woodland must be managed so that there are large openings in the crown canopy of the wood-producing trees. In northern Michigan beaver cuttings will have to be curtailed now that aspen has a stumpage value. Grouse, deer, hare and rabbit have seriously damaged young tree plantations.—P. A. Herbert.

281. Jahoda, W. J. (*U. New Hampshire, Durham.*) Use of oaks by beavers in New Hampshire. *Jour. Wildlife Management* 10(4): 366-367. 1946.—Beavers are extensively cutting white and red oaks (*Quercus*) in the Pawtucket-away region of New Hampshire even though food spp. are common. Many trees up to 21 inches in diam. were girdled or felled, but only one showed signs of possible food utilization.—W. J. Jahoda.

282. Kalmbach, E. R., and J. F. Welch. (*U. S. Fish and Wildlife Serv., Denver, Colo.*) Colored rodent baits and their value in safeguarding birds. *Jour. Wildlife Management* 10(4): 353-360. 1946.—The use of color to make poisoned baits more selective in rodent control and less destructive of seed-eating birds was demonstrated in Colorado and S. Dakota. In the latter area strychnine-poisoned baits were exposed in approved manner for the control of Richardson ground squirrels. Part of this grain was uncolored, part dyed yellow and part green. A search for poisoned birds on 8 exptl. plots disclosed 85 killed by feeding on uncolored grain and 9 by feeding on yellow grain. No dead were found on areas treated with green grain. Stomach examination of the victims verified the fact that green bait and, to a lesser degree, yellow bait are not as readily accepted by birds as the uncolored. Expressed differently, it was found that 77 pounds of uncolored bait killed birds at the rate of 1.1 birds per lb.; 45.5 lb. of yellow bait killed them at the rate of 0.2 bird per pound; and 19 lb. of green bait killed no birds.—E. R. Kalmbach.

283. Lay, Daniel W. (*Game, Fish and Oyster Comm., Austin, Tex.*) The problem of undertrapping in muskrat management. *Trans. North Amer. Wildlife Conf.* 10: 75-78. 1945.—On the coastal marshes of Texas where there is more-or-less year-round breeding, little ice, and extensive brackish marsh, no examples of overtrapping have been found; but undertrapping is common. Diminishing returns to the trapper prevent overtrapping of any significant acreage, since 1-2 pair per acre is sufficient breeding stock. Undertrapping causes increased losses from intraspecific strife, droughts, drifting, predation, and in extreme cases destructive "eat-outs" of the marsh flora. Catches of > 20 to the acre have been made without reduction of subsequent crops.—D. W. Lay.

284. Leopold, Aldo. (*U. Wisconsin, Madison.*) The outlook for farm wildlife. *Trans. North Amer. Wildlife*

*Conf.* 10: 165-168. 1945.—Wildlife is the product of a balance between food and cover. On worn-out soils cover is increasing but food decreasing. On fertile soils cover is decreasing, hence the food is unavailable. Balance, where it exists, results from negligence rather than design. Landscapes in process of losing their balance often yield well. Loss of stability in the wild community is attended by pest behavior in a few species, some native, others imported. Land-health requires diversity not only in crops but in native flora and fauna.—Aldo Leopold.

285. Murie, Adolph. (*U. S. Fish and Wildlife Serv., Jackson, Wyo.*) The Merriam turkey on the San Carlos Indian Reservation. *Jour. Wildlife Management* 10(4): 329-333. 1946.—*Meleagris gallopavo merriami* formerly was more common on this Arizona reservation, in pine forests, and down to 4,000 feet in winter. Indians learned recently to appreciate turkeys as food, and are allowed to hunt without limit; one shot 14 down during a single morning. Both white and Indian hunters wound many which are not recovered. The food in crops and droppings contained only traces of insects, some pebbles, and 37 identified plants. Ragweed, goldenrod, sunflower, and an eriogonum were most important; all these plants have increased under heavy livestock grazing. Acorns, when available, some juniper berries, and seeds of yellow pine are eaten by these turkeys.—T. I. Storer.

286. Nagel, W. O. (*Missouri Conserv. Comm., Jefferson City.*) Fur—a wild crop of great value. *Missouri Conservationist* 6(12): 4-5, 10. 2 fig. 1945.—Fur means many things to many people—life, luxury, pocket money, jobs. To the conservationist it means a valuable resource worth perpetuation. In the 45 years of the present century the farm boys and trappers of Missouri alone have received from the sale of pelts a total sum amounting to about 1½ times the original price of the entire Louisiana Purchase. Fur is defined, measurements of quality given, principles of management explained, and some good practices for individual landowners pointed out.—W. O. Nagel.

287. Nagel, W. O. (*Missouri Conserv. Comm., Jefferson City.*) This matter of winter feeding. *Missouri Conservationist* 7(1): 1, 14-15. 2 fig. 1946.—Winter feeding can help wildlife or do it harm. Normal winter weather is not a serious handicap to native species provided with adequate natural food and cover. Supplementary feeding may become necessary or desirable under two sets of conditions: (1) to provide good supplementary food in emergency periods, or (2) to attract winter songbirds for study and enjoyment. In either case it is essential to know when to feed, what kind of food to use, and how to put it out. The three important things in emergency feeding are: (1) to put food in protected places where birds can find it; (2) see that food is available every day, and (3) continue feeding throughout the emergency period. Songbirds should be fed in safe places only, where conditions for observation are good. Once begun, a songbird feeding station should afford food throughout the winter.—W. O. Nagel.

288. Nagel, W. O. (*Missouri Conserv. Comm., Jefferson City.*) Problems and principles of squirrel management in Missouri. *Missouri Conservationist* 7(7): 1-3. 2 fig. 1946.—The 19,000,000 acres of Missouri squirrel range are well-distributed and easily accessible to most hunters, but considerable and frequent fluctuations in squirrel populations result in varied hunting success. These fluctuations are chiefly due to variations in production of young, most severe in the spring breeding season. Small crops of spring young appear to follow winters of low food (mast) availability. Since the hunting season opens May 30, such shortages of young squirrels are markedly evident in the early part of the season, and less evident in late Oct., following a generally-normal crop of young. The long open season affords summer hunting while it offers a means of reducing damage from overpopulations to corn crops in Aug. The occurrence of pregnant or nursing squirrels during the hunting period is objectionable to some hunters, but with care a hunter can almost entirely avoid killing squirrels in this condition.—W. O. Nagel.

289. Nagel, W. O. (*Missouri Conserv. Comm., Jefferson City.*) The beaver—history maker—is coming back. *Missouri Conservationist* 7(9): 6, 7, 16. 3 fig. 1946.—Beaver fur was the chief incentive for pioneering in Missouri and the northwest, and the pursuit of beaver and other furs was a

prime factor in the annexation of the Northwestern Territory. Fur traders smoothed the path for settlers. The beaver itself almost disappeared; by 1915 there were few if any left in Missouri. Two pairs were released in 1928, the season was closed, and increase from these and remnant natives resulted in a well-distributed population of at least 1,000 by 1946. Chief limitations are floods and lack of enough good foods, both due to excessive clearing, cultivation, fire, and grazing. Thus beavers, like man, are dependent for prosperity on wise land use.—W. O. Nagel.

290. Nagel, W. O., and H. V. Terrill. (*Missouri Conserv. Comm., Jefferson City.*) Taking the wildlife census. *Missouri Conservationist* 7(3): 2, 3-11. 4 fig. 1946.—For practical purposes it is impossible to enumerate whole populations by direct counts; this difficulty is overcome by the use of indices or sample counts, either of individuals or population units, or some characteristic evidence of them. Direct counts may be made of sample populations on sample areas, and converted into total populations by calculation. The use of signs (tracks, droppings, dens) and songs or calls is sometimes resorted to; this requires a thorough knowledge of the habits of the species studied. A knowledge of annual production should follow a count of breeding stock. This is not a constant; it must be detd. every yr., preferably in advance of the hunting season, to be useful in setting regulations. Food shortages and other emergencies influence production; these sometimes provide advance warning of coming shortages, and development of methods of evaluating the effects from the causes holds promise in predicting annual crops.—W. O. Nagel.

291. Penfound, William T. (*Tulane U., New Orleans, La.*), and John D. Schneidau. (*Loyola U., New Orleans, La.*) The relation of land reclamation to aquatic wildlife resources in southeastern Louisiana. *Trans. North Amer. Wildlife Conf.* 10: 308-318. 1945.—Of 70 reclamation projects of wetland areas by pumping in southeastern Louisiana, only 8 were in operation in 1940. The status of 3 projects is presented in the report. In all projects which reached the drainage stage the original aquatic organisms were destroyed. The potential economic return from these plant and animal resources (at least \$5 per acre per yr.) has not been compensated by crop returns in the reclaimed areas. In a detailed discussion of the management of wetland areas the authors conclude that, with few exceptions, "any practice that will prevent, or retard, aquatic succession, or return it to an earlier successional stage, will result in an increase in wildlife production."—W. T. Penfound.

292. Ratcliff, Harold M., and Lowell Sumner. (*Nation. Park Serv., Santa Fe, N. Mex.*) National park wildlife ranges. *Trans. North Amer. Wildlife Conf.* 10: 246-250. 1945.—On limited range and in the absence of native predators, certain wildlife spp. tend to increase in numbers far exceeding the capacity of the available range to support them. Some spp., notably elk and deer, have increased to the point where it has become necessary to reduce them for the good of the range as well as the welfare of the animals themselves. Cooperation with the various State Fish and Game Commissions has resulted in the reduction of some species, in especially troublesome spots, namely, deer in Zion National Park, Utah, elk and deer in Rocky Mt. Natl. Park, Colorado, and the Northern Yellowstone elk herd, Montana. Competition with saddle and pack stock in heavily used recreational areas such as the High Sierra country in Sequoia-Kings Canyon National Park California, is a serious problem that needs attention through regulation of length of use of the camp spots, erection of drift fences to control stock, and possible feeding of hay where possible. Wild burros and bighorn sheep in Death Valley compete for both forage and water, resulting in the reduction of the burro population to a point where it does not interfere too much with the bighorn use of the area. The termination of grazing of domestic livestock in wildlife areas of the Southwest is especially important in order to maintain sufficient forage for wildlife species in these areas.—H. M. Ratcliff.

293. Salyer, J. Clark II. (*Fish and Wildlife Serv., Chicago.*) The permanent value of refuges in waterfowl management. *Trans. North Amer. Wildlife Conf.* 10: 43-47. 1945.—In view of the continued expansion of intensive land utilization in the U. S., the national wildlife refuge program provides a lasting safeguard against possible de-

pletion of the waterfowl population. This program embraces the restoration of breeding grounds, resting and feeding places, and wintering areas. Industrialization along the Atlantic seaboard during the past decade, including the drainage of marshes for resort development and mosquito control, has eliminated > 7 million acres of waterfowl habitat. Flood control, irrigation and power projects, and ill-advised drainage projects now menace vast acreages of the remaining waterfowl territory. Controlled water levels, a management practice which has been developed and put into effect on the refuges, permit the production of more waterfowl food per acre than is possible on lands not so managed. The waterfowl refuges provide a habitat for many interesting and important non-game species of wildlife, some of which, as the fur animals, are of great economic importance. These refuges have become very valuable in the economic life of nearby communities.—J. C. Salyer, II.

294. Schwan, H. E. (U. S. Forest Serv., Denver, Colo.) Big game and livestock on the western range. *Trans. North Amer. Wildlife Conf.* 10: 219-224. 1945.—The effect on the range of grazing by big game animals, livestock, and rodents is discussed. Competition between these groups and between species of animals is extremely variable because of preference for different forage plants and for different kinds of terrain and has resulted in modifying the dominant vegetation types. Use by one group or species may result in better forage conditions for other animals. Within limits, the various groups of animals might be used to effect desired changes in vegetation. A program of intensified research, improved resource inventories, and a practical ecological approach is suggested to obtain maximum public benefits from range lands.—H. E. Schwan.

295. Siegler, Hilbert R. (New Hampshire Fish and Game Dept., Concord.) Waterfowl and their management in inland Texas. *Trans. North Amer. Wildlife Conf.* 10: 274-280. Map. 1945.—A study of waterfowl during the winter months and their management in the timber belt of eastern Texas involving an area of about 28,850 sq. miles was made from 1939 to 1944. A total of 510 streams, more than 222 lakes over 20 acres in size and the 110 sq. mile Caddo Lake in this area influence waterfowl populations. A brief sketch of the month to month waterfowl picture as it is affected by seasonal migrations is presented. The common mallard (*Anas p. platyrhynchos*) and wood duck (*Aix sponsa*) are the commonest surface-feeding winter residents; the ring-neck (*Nyroca collaris*) and scaup (*N. affinis*) the most abundant divers. Ten most used foods by surface-feeders and those by divers are listed. Eastern Texas hunting, with minor variations, falls under 4 major categories: (1) club lake, (2) public and private lake, (3) Caddo Lake, and (4) river-bottom hunting. In 1939, 89 experienced hunters hunted an average of 3.7 times each, shot a total of 790 ducks and geese, or an average of 2.46 waterfowl on each hunt. They spent an average of \$3.71 for each duck. The following items of mgmt. placed in order of their importance are recommended to hold more ducks in eastern Texas: construction of more and larger lakes, establishment of more and better refuges (but not within 50 miles of, and exclusive of, the coastal plains), creation of better cover, and improvement of food conditions. More food can be provided by inundating more land, by saving acorn-bearing oaks (*Quercus*) in river bottoms, by fostering growth of button bush (*Cephalanthus occidentalis*), by fencing ponds against grazing, but not by planting wild rice. A major cause for unsatisfactory hunting in eastern Texas lies with the average hunter himself; his unsportsmanlike attitude toward bag limits, his lack of ability in the art of calling ducks, his ignorance of the possibilities in the river bottoms, and his habit of doing most of his hunting at the beginning of the season rather than later when most mallards arrive.—H. R. Siegler.

296. Skinner, Curtis K. (Yellowstone Nation. Park, Wyo.) Live elk weights. *Wyoming Wild Life* 10(7): 32. 1946.—Wts. of 46 specimens: 15 bulls, 9 cows, 9 ♂ calves, 11 ♀ calves, and 2 spike ♂♂.—F. C. Edminster.

297. Spinner, George P. (Bombay Hook Nation. Wildlife Refuge, Smyrna, Del.) Improved method for estimating numbers of waterfowl. *Jour. Wildlife Management* 10(4): 365. 2 pl. 1946.—A series of photographs, of accurately counted flocks in numbers from 100 to 1000, are mounted in a small handbook. The flocks are in 2 shapes, groups and

long strings, the basic flying formations of waterfowl. An observed flock is compared with the photographs to arrive at its approx. size.—G. P. Spinner.

298. Steen, M. O. (Missouri Conserv. Comm., Jefferson City.) Quail season early or late? *Missouri Conservationist* 7(1): 4-5. 2 fig. 1946.—The question of early vs. late quail seasons is a perennial argument. Much may be said on both sides, but one of the basic principles is seldom mentioned. The key to upland game bird shooting and management is the bird of the year. In quail the average annual turnover is nearly 80%; quail harvests in a normal year average about  $\frac{1}{3}$  young birds. With the proportion of young so important in determining a successful harvest, and the high turnover, it is desirable to set the season of harvest as close as practicable to the season of production, to insure better hunting and better use of the annual crop.—W. O. Nagel.

299. Steen, M. O. (Missouri Conserv. Comm., Jefferson City.) Deer in great droves. *Missouri Conservationist* 7(2): 1-3. 2 fig. 1946.—From 1,000,000 to 400 deer in a single century is Missouri's record, a reduction accomplished by hunting. Deer have increased again in recent yrs. to a population of about 20,000. With this start and with good management and no more than normal mortality, this population could be increased to 200,000 in 10 yrs. Illegal and accidental killing of does is the greatest obstacle to the attainment of this goal. The Commission intends to step up the live-trapping and redistribution program to top level, and retain the buck law until the deer range is filled to capacity.—W. O. Nagel.

300. Stoddart, L. A. (Utah State Agric. Coll., Logan), and D. I. Rasmussen. (U. S. Fish and Wildlife Serv., Logan, Utah.) Big game-range livestock competition on western ranges. *Trans. North Amer. Wildlife Conf.* 10: 251-256. 1945.—Large increases in big game numbers have brought to a head the problem of game-livestock competition on western U. S. ranges. Steepness and lack of water cause many game ranges to be little used by livestock and, on these areas, competition is not serious. On limited spring range, however, the problem may be acute. Attempts to supplement natural foods of game on spring ranges have proved unsuccessful. Control of livestock and game numbers appears the only solution to the problem of overgrazing. Condition of the range is the index to populations in big game management. Actually big game-livestock competition is far less than generally supposed: they have different dietary habits, and they graze different parts of the range to a large extent. It would be necessary to remove 10 to 50 deer to make room for one more cow. Seldom would as much as 25% increase in either game or livestock be made possible by removal from the range of all animals of the other kind. Competition is much intensified, however, by excess numbers of either game or livestock. Proper game and livestock management are necessary to good land management and sportsmen and stockmen should strive for better knowledge of what good range condition is and how it is attained.—L. A. Stoddart.

301. Sylvester, W. R., and P. W. Lane. (Kentucky Woodlands Nat. Wildlife Ref., Golden Pond.) Trapping wild turkeys on the Kentucky Woodlands Refuge. *Jour. Wildlife Management* 10(4): 333-342. 2 fig. 1946.—Technics were developed and live-trapping was prosecuted on the Ky. Woodlands Refuge during 1943 and 1944-45, removing 54 turkeys (*Meleagris gallopavo silvestris*). Trapping was possible because of a poor mast crop and because of a conc. of 1 bird to 16 acres on parts of the refuge. Trapping was best during fall months, but could be continued during the winter. Poults were caught more easily than adults, and ♂♂ easier than ♀♀. Trapping sites were located near surrounding food and cover and then baited with wheat. When turkeys took bait, the traps were constructed slowly out of poultry netting. The most successful traps were approx. 10 ft. wide, 15 ft. long, and 6 ft. high with a drop-door at each end released by an observer. Traps without observers were subject to predation and were unsatisfactory. Various funnel, trench, drop, rush, and drop-door traps were used. A new type of carrying crate 6-12 in. wide, 30 in. long, and 30 in. high, containing 1 bird was most satisfactory for transportation to release pt. Trapped birds should be released within 24 hrs. in an open area so they can fly before entering the



forest. Live-trapping is difficult, time consuming, and costly, but satisfactory results are obtained.—*W. R. Sylvester.*

302. Terrill, H. V., and Bill T. Crawford. (*Missouri Conserv. Comm., Jefferson City.*) Using den boxes to boost squirrel crop. *Missouri Conservationist* 7(8): 4, 5. 2 fig. 1946.—Wartime timber harvest adversely affected cavity-nesting spp. like squirrels. Experience has shown that such cutting, followed by fires, may eliminate occupancy by squirrels for 10-25 yrs. Den-trees as well as nests are normal requirements, particularly for breeding-season use. 3 den trees are needed for each pair of squirrels. This need may be met through the construction of den boxes, at the rate needed to insure 3 dens (either trees or boxes) for each unit of the 150 full-grown trees, including 60 or 70 mast-producers, needed by each pair. Building plans for a suitable nest-box are shown in the accompanying figure.—*W. O. Nagel.*

303. Texas game, fish and oyster commission. *Principal game birds and mammals of Texas. Their distribution and management.* 148p. 22 maps, 53 fig. Texas Game, Fish and Oyster Commission: [Austin, Texas], [1946].—Twelve important native spp. of upland game birds, numerous waterfowl, over 12 native big game and other mammalian forms, and several exotic spp. of birds and mammals comprise the basis of this treatise. 22 maps in color depict their present and former ranges within the State. Tables and photographs aid in presenting an accurate, detailed account of the history, habits, foods and habitat preference, current status and the problems of management of each. Texas has been divided into 9 game regions based on vegetation types, each supporting a characteristic fauna and subjected to variations in land use. The part played by land use, and abuse, in restricting or influencing population is emphasized. Reasons for scarcity or abundance of wild game are presented through compilation of facts by competent technicians in and out of the Commission. Appeal here is directed toward both the sportsman and the average citizen interested in Texas wildlife resources. The mourning dove is the most abundant game species in the State. The Attwater prairie chicken, mountain sheep, and black bear are vanishing spp. Status of antelope and wild turkey is improving. Among exotics the eland and black buck are said to be increasing on private ranches. An increased awareness on the part of the public will be necessary to maintain Texas wildlife resources.—*M. R. Throckmorton.*

304. Tulenko, Paul Q. (*Missouri Conserv. Comm., Jefferson City.*) The Federal-Aid Wildlife Program in Missouri. *Missouri Conservationist* 7(7): 4, 5-15. 3 fig. 1946.—The first Federal Aid project in Missouri was set up Dec. 1, 1938, with 5 project leaders assigned respectively to the 5 major regions. The objectives were: (1) to find what

factors were limiting restoration and increase of wildlife, (2) to determine opportunities for corrective measures, and (3) to find the incentives needed to induce landowners to practice good wildlife management. An example of the many findings and applications is the discovery of the shortage of good water areas as a limiting factor and the development of a farm pond program that swept the state and into other states. Another is the acquisition of evidence that wildlife problems are inescapably linked with the land, and with fertility as a key factor in land capability. A state-wide analysis of wildlife conditions and census of species was made using samples of the 38 major soils as units of investigation. The techniques and findings were applied in more detail to studies of major watersheds. Increases in personnel permitted subject assignments, which have been particularly effective in guiding management of raccoon, wild turkey, deer, quail, prairie chicken and cottontail rabbit, and in pointing out needs in water-fowl management within the state. To date emphasis has been more on practical investigations than on acquisition of lands; present emphasis is shifting toward the latter objective.—*W. O. Nagel.*

305. Yeager, Lee E. (*Illinois Nat. Hist. Surv., Urbana.*) Capacity of Illinois land types to produce furs. *Trans. North Amer. Wildlife Conf.* 10: 79-86. 1945.—An annual per acre fur income on the 6 most important Illinois land types varies from \$11.59 for ditches to \$0.71 for wooded upland. Glacial marsh and river marsh, with annual incomes of \$4.45 and \$2.38 per acre, respectively, ranked 2d and 3d. Quantitatively, income on all types was directly proportional to the muskrat (*Ondatra*) harvest, which, in turn, reflected the quality of the types as muskrat habitat. Ditches provided the best muskrat habitat, and showed the greatest catch density in 4 of 7 additional spp., due mainly to the concentrating effect of cultivation on fur animals along this land-water type. Ungrazed ditches indicated a per acre income approximately 11 times greater than grazed ditches. Furs represent only a part of the wildlife yield on uncultivated lands, since most of the upland and other game is produced on the same areas. Management that insures the production of this multiple wildlife crop involves no practice adverse to progressive agriculture.—*L. E. Yeager.*

306. Yeatter, R. E. (*Illinois Nat. Hist. Surv., Urbana.*) Electric incubator for game bird eggs. *Jour. Wildlife Management* 10(4): 342-347. 1 pl., 5 fig. 1946.—Consists of a standard bee hive body (with modification and at cost of \$6.00 for materials) insulated on sides, fitted with a tray, an egg-turning grid, an electric heating coil, and thermostat control. Moisture is supplied by water in a flat pan under the tray. Optimum temp. for pheasant eggs: 100.5°-101° F through the 19th day and 100° F thereafter.—*T. I. Storer.*

# BIOLOGICAL ABSTRACTS

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## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*

### PHILOSOPHY OF BIOLOGY

2485. Falkenström, G. Zur Begründung der Realität der systematische Einheiten und der Rationalität der biologischen Systeme. [Reality of taxonomic units and rationality of biological systems.] *Biol. Gen. [Vienna]* 16(1/3): 20-40. 1942.—Against Driesch's criticisms, which contest the rationality of biological systems and the reality of their units, the author defends the biological systems as having both these qualities in a high degree.—*Max Onno.*

2486. Friederichs, K. (*U. Posen.*) Über den Begriff "Umwelt" in der Biologie. [The concept of "Umwelt" in biology.] *Acta Biotheoretica* 7(3/4): 147-162. 1943.—The word "Umwelt" is not defined as yet and can perhaps not be defined. In its original sense, as first used by Uexküll, it means the relations of an organism to its surroundings, involving those affecting the receptor (sense) organs and the effector organs (muscles, glands), as opposed to vegetative relations with the medium, such as respiration. The "Umwelt" conception in ecology has always been a wider one, but by implication rather than explicit definition. H. Weber has tried to develop a "general biological Umwelt-conception", including all relations. In spite of this claim he states the "Umwelt" of a sp. implies only those external conditions which are indispensable for its life. This conception is insufficient, because it does not contain such fundamentally important factors as the enemies of an organism and the effect of the organism on its surroundings (e.g., formation of limestone, humification of soil, turning of lakes into land by vegetation). Furthermore, such a conception of "Umwelt" does not embrace external conditions determining the phenotype but not indispensable for the life of the sp. Such a "general biological conception of Umwelt" as Weber claims to have created is impossible; the conception is divided in parts corresponding to its application in different branches of science. Thus, in physiology only the direct relations of an organism come into question; in epidemiology, only the vital relations. The ecologic conception is the most comprehensive, embracing all those factors in the environment with which an organism has direct or definite indirect relations.—*Auth. summ.*

2487. Raven, Chr. P. (*U. Utrecht.*) Sur les notions de "gradient" et "champ" dans l'embryologie causale. *Acta Biotheoretica* 7(3/4): 135-146. 1943.—Since in biology the "field" concept is used in different ways, its meaning in biology, as compared with that in physics, and the relation between the concepts of "gradient" and "field," are studied. In physics, scalar fields, vector fields and tensor fields are distinguished. In a scalar field, the variation of the scalar in space is expressed in form of a gradient. For the whole of a scalar field with its derived gradients the term "gradient-field" may be used. In biology, especially in exptl. embryology, the field concept is used both in a purely descriptive sense and as a means of causal analysis. To the first group belong the kinematic fields and growth fields. The kinematic field is a vector field; the growth field is generally a tensor field, but may be treated as a gradient-field in the simplest cases. In the causal analysis of development the gradient-field plays an important part, in the form of axial, superficial and spatial gradient-fields. In such a field by the combined action of the scalar and the gradients a great diversity of relations may occur. Probably, both the induction field

and the organisation field belong to the class of gradient-fields.—*Auth. summ.*

### TAXONOMY AND NOMENCLATURE

2488. Hatch, M. H. (*U. Washington, Seattle.*) Nameability in taxonomy. *Ent. News* 57(6): 141-143. 1946.—The problem of what to name and what not to name, in plant and animal classification, is a product of evolutionary biology. Nameability can not be resolved primarily by reference to the natural objects to be named. It can only be solved by erecting a set of assumptions as to what, in the light of biological phenomena being such as they are, is useful and expedient to name. It is, therefore, proposed that only populations merit specific and infraspecific names, not because other classes of specimens may not be recognizable, but because in the present state of biological knowledge, the population is the first system above the level of the individual to possess biological efficacy. It is suggested that editors should refuse to publish descriptions of undescribed non-population categories to which Latin names are attached unless these requirements are followed by authors.—*J. L. Williams.*

2489. Smith, A. C. The principle of priority in biological nomenclature. *Chron. Bot.* 9(2/3): 114-119. 1945.—A recently published article by Franz Heikertinger calls for uniformity and stability of nomenclature by retaining the better-known recent name rather than reviving an older forgotten one. Such suggestions are at variance with the well-established principle of priority and tacitly assume that systematists have already reached all conclusions necessary regarding the classification of plants and animals. Immutability is not to be found in biology, least of all in a virile branch like systematics.—*E. L. Core.*

2490. Smith, Hobart M. (*Texas Agric. and Mech. Coll., College Station.*) Hypoparatypes. *Science* 104(2701): 331. 1946.—Specimens not wholly representative might be listed as hypoparatypes. These would be neither the holotype nor paratype.—*H. M. Kaplan.*

### INSTITUTIONS, ADMINISTRATION

2491. Boyko, Hugo. On the need for an international network of plant sociological stations. *Chron. Bot.* 9(2/3): 86-88. 1945.—Applied plant sociology reaches deep into the sociological structure of mankind, and there is a need for the valuation and classification of regions on a basis of the most trustworthy index, their natural vegetation, with world standards from a suitable network of plant sociological stations. This is a valuable service which science can render to statesmen.—*E. L. Core.*

2492. Chicago Natural History Museum. Report of the Director to the Board of Trustees for the year 1945. 135p. 2 pl., 33 fig. 1946.—Besides lists of officers, trustees, staff, various kinds of members, etc., financial statements, list of accessions, articles of incorporation, amended by-laws, this report includes separate reports from the various departments of the museum. It is announced that the name "Fieldiana" will be used henceforth for technical publications of octavo and quarto size.

### MISCELLANEOUS

2493. Bertholf, Lloyd M. (*Western Maryland Coll., Westminster.*) International biology. *Bios* 17(3): 155-156.

1946.—A challenge to biologists to resist efforts to nationalize science "for the dictators' sake" and to work for dissemination of scientific truth.—L. J. Gier.

2494. Billmyer, James H. S. *The Cayman Islands*. *Geogr. Rev.* 36(1): 29-43. 20 fig. 1946.—An account is given of the location, climate, history, occupations and way of life of the inhabitants. Principal occupations are seafaring, turtling, and boat-building. Health of the community is good. There is little farming and livestock raising but garden crops do very well. The main crops are potatoes, rice, yams, cassava, and beans. Breadfruit is also grown. Flowering plants of southern Europe, as well as tropical forms are in cultivation. Sugar cane and cotton are important crops in the last century, but are not now grown. The coconut palm was formerly abundant, but had rot appeared in the last century and few palms are left. Thatch-palm rope, made at home by the poorer people, is the only export aside from turtles. Before the war about two million fathoms were exported annually. Logwood is fairly plentiful, but little has been exported during the past 20 yrs.—F. W. Foxworthy.

2495. Bragg, Arthur N. (*U. Oklahoma, Norman.*) *Confusion thrice confounded*. *Bios* 17(2): 99-102. 1946.—Some inconsistencies in our definitions of common biological terms, e.g., mitosis, ovum, organ, biology, taxonomist, etc.—L. J. Gier.

2496. Daley, Chas. *Nature notes on Canberra*. *Victorian Nat.* 63(3): 52-54. 1946.

2497. De Vries, Louis. (*Iowa State Coll., Ames, Iowa.*) *German-English science dictionary*. 2nd ed. 558p. McGraw-Hill Book Co., Inc.: New York, 1946. Pr. \$4.50.—

This dictionary, though intended primarily for chemists is useful for general purposes. It contains many biological terms from anatomy, bacteriology, botany, etc.

2498. Hewitt, W. F. Jr. (429 Arch St., Philadelphia, Pa.) *The Journal Club: Designed for busy physicians*. *Jour. Amer. Osteopath. Assoc.* 45(8): 361. 1946.—To save time and obtain comprehensive coverage of a large group of journals, physicians are urged to pool their individual abilities to read, abstract, review and discuss, in such organizations, details of operation which are outlined.—W. F. Hewitt, Jr.

2499. Meyer, Bernard S. (*Ohio State U., Columbus.*) *The case for greater cooperation among the plant science societies*. *Plant Physiol.* 21(4): 379-385. 1946.

2500. Richards, A. (*U. Oklahoma, Norman.*) *The present crises*. *Bios* 17(3): 131-141. 1946.—Discussion of the disciplinary and applied aspects of biology, with special emphasis upon the relation of ecological succession to human welfare.—L. J. Gier.

2501. Spoehr, H. A. (*Stanford U., Calif.*) *The coming of age of the American Society of Plant Physiologists*. *Plant Physiol.* 21(4): 386-392. 1946.—Retiring President's address.

2502. Verdoorn, Frans. (Editor.) *Merrilleana*. *Chronica Botanica* 10(3/4): 127-394. Frontispiece, 4 fig. Chronica Botanica Co.: Waltham, Mass., and G. E. Stechert and Co.: New York, 1946. Pr. \$4.—The present volume, reprinting 23 of his articles, is issued in honor of Elmer Drew Merrill, and on the occasion of his seventieth birthday. The volume also includes a portrait of Dr. Merrill and a complete bibliography of his writings in the period 1899 to 1945, with 16 titles in 1946.

## BIOGRAPHY, HISTORY AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 2501, 2502, 2591, 3597, 3805, 4459, 4540)

### HISTORY

2503. Frazier, Chester North. (*U. Texas, Galveston.*) *Heterodoxy and medical progress*. *Bull. History Med.* 20(1): 58-68. 1946.—It is necessary to know the times in which men live if the significance of the ideas they expressed is to be understood. In a period of violent readjustments Michael Servetus was born. A Spaniard educated in theology, medicine, and law, in his book, *The Restitution of Christianity*, he revealed a clear view of the pulmonary circulation. Because he believed physiology to be a path leading to the knowledge of God, Calvin had him burned at the stake. He represented the transition of medicine from religious to secular authority. Contemporary was Paracelsus, one of the few men who advanced medicine by quarreling about it. He was the precursor of a new era of chemical activity in medicine, perhaps the most original thinker of the 16th century. The 17th century had been marked by great discoveries of Vesalius, Harvey, Malpighi, and Leeuwenhoek. The methods of the ancient Greeks were enshrined in the person of Sydenham. He was neglected and opposed by his contemporaries. The brutalities of earlier times had largely disappeared at the close of the 18th century when appeared one of the most noble figures of medicine, Philippe Pinel. To him insanity meant disease. The discoveries of Boyle, Priestley, Lavoisier, Morgagni, Auenbrugger, Laennec, and Jenner set the scene for the next great epoch in medical history, when Semmelweis robbed child-birth of its greatest terror, and O. W. Holmes was violently opposed by Philadelphia obstetricians. If it was the unorthodox adherents of medicine who wrought progress from within, it was the heterodoxy of the people which affected medicine from without. The barber was the surgeon of the people when doctors dared not soil their hands. Ambroise Paré, a dresser at the Hôtel-Dieu, in the field with the French armies revolutionized surgery and became an immortal of medicine. In the early 18th century homeopathy was founded by Hahnemann with the notion that the effect of drugs was enhanced by division into minute doses. The extreme popularity of homeopathy is evidence of relief from overdosing. The healer never lacked followers. Best known was Phineas Quimby, precursor of Mary Baker Eddy, who established the most potent movement. Osteopathy and chiropractic have added physical manipulation to suggestion.

Medicine yielded some to each. Paracelsus had used magnets in treatment of diseases. Then came Mesmer with his animal magnetism and spectacular seances. In the middle of the 19th century Charcot returned to the Salpêtrière where hysteria became his study. Sigmund Freud, pupil of Charcot, with clearer view saw that hysteria had a meaning in the emotional life of his neurotic patients. More and more the noxious influence of environment became the concern of popular authority, chiefly in the 20th century. At the beginning of the Industrial Revolution certain citizens of Manchester, England, joined in what was probably the first board of health. One of them, Robert Owen, became the father of industrial hygiene. Knowledge of medicine we have, its distribution has only commenced. Medical problems again await solution. Now an economic tool is sought.—R. P. Bigelow.

2504. Semashko, N. A. (*Acad. Med. Sci., USSR.*) *Friedrich Erismann, the dawn of Russian hygiene and public health*. *Bull. History Med.* 20(1): 1-9. 1 fig. 1946.—Friedrich Erismann (1842-1915) left an indelible mark on the evolution of hygiene. A number of fundamental propositions put forth by him in the science and practice of hygiene remain unshakable even in our time. Coming to Russia from Switzerland in 1869, at the time of the "great reforms" of the establishment of Semstvo rural medicine, he began at Petersburg as a simple eye-doctor, but soon plunged into problems of preventing diseases of the eyes, especially nearsightedness in school children, and wrote a number of papers on the life and sanitary conditions of the Petersburg poor. In 1879 he went to Moscow. With a group of public health physicians, during 6 yrs. he inspected 1080 factories employing 114,000 workers. The 17 reports, 6 written by himself, pointing out the tasks of the Semstvo in the supervision and control of sanitation, labor conditions, and housing, are models of their kind today. In 1882 he became Professor of Hygiene in the Medical Faculty of Moscow Univ., the first independent chair of hygiene. He built a laboratory for students and trained public health physicians. Finally in 1890 he opened the Institute of Hygiene built by him on the Deviche Polyé. He sharply defined the concept of hygiene. Opposing Dobroslov of Petersburg, he held that to be a hygienist one must know the physiology and pathology of man, and for



this medical training is required. He created a public health office and laboratory to care for the needs of the city. Health of the individual, he wrote, is merely part of the health of society, and poverty is the most universal scourge of the Russian people. The Tzarist government could not arrest this dangerous professor, a Swiss citizen, but deprived him of his chair while in 1896 he was on vacation in Switzerland. He never returned to Russia.—*R. P. Bigelow.*

2505. Shryock, Richard H. (*U. Pennsylvania, Philadelphia.*) The health of the American people. An historical survey. *Proc. Amer. Phil. Soc.* 90(4): 251-258. 1946.—The history of American health during the past 2 centuries is concisely summarized, beginning with the time when disease was a serious menace to the early colonies and ending with a description of the contemporary scene in which public health is seen as the product of the growing concern of private philanthropy and of government. The increased dependence upon advanced medical education and research and upon expanded hospital services is illustrated and it is suggested that these institutions be reoriented toward greater emphasis on preventative care.—*P. S. Stokely.*

2506. Sigerist, Henry E. (*Johns Hopkins U., Baltimore, Md.*) The place of the physician in modern society. *Proc. Amer. Phil. Soc.* 90(4): 275-279. 1946.—The physician in the Greek society of the time of Hippocrates was looked upon as a skilled craftsman, but in the Middle Ages he became a respected scholar, trained in the universities. In the Renaissance began the rise of a highly competitive economic order which continued to this present day. In such circumstances the physician was forced to sell his services as his Hippocratic forebears had done. Within the last 50 yrs., medical science has become increasingly technical and specialized, and at the same time it has become more generally accepted that the member of a modern state has a right to have available all the means necessary for the protection and restoration of health. More and more has medicine become a social science in which the physician promotes health not only by restoration of health in time of sickness, but also by practising preventive medicine on a large scale.—*P. S. Stokely.*

2507. Temkin, Owsei. (*Johns Hopkins U., Baltimore, Md.*) The philosophical background of Magendie's physiology. *Bull. History Med.* 20(1): 10-35. 1946.—A tentative answer is given to the question as to how far Francois Magendie (1783-1855), physiologist, exptl. pharmacologist, hygienist, and medical practitioner, was dependent upon a philosophical current of his time and in how far did he himself give a new direction to that current. As a physiologist Magendie treated the human intellect as a function of the brain. He held an impersonal concept of science. But, although throughout his life distrustful of theory, he conceived his program largely on theoretical grounds. Were the theoretical opinions underlining his physiological work related to the "idéologie" of Destutt de Tracy (1754-1836) and Cabanis (1757-1808), with which he was acquainted as a medical student? In 1809, the year after his graduation, Magendie brought out "Quelques idées générales sur les phénomènes particuliers aux corps vivans," in which he announced the general principles to which he was to adhere for the whole of his career. He insisted that the physiologist had to treat intellectual phenomena as the result of the action of the brain. However, he gives some of the fundamental principles of ideology, the science of the intellect. The phenomena which constitute the intellect are only modifications of the faculty of feeling, of which, with Destutt de Tracy, he distinguished 4 principal modifications: sensibility, memory, judgement, and the desires or will. Magendie acknowledged his indebtedness to the idéologues for the basic ideas of the relation between body and mind; not so for the relationship of matter and life. Nevertheless, a parallel can be perceived which goes far to explain his vitalistic attitude. In the 18th century a reaction had set in against the mechanistic views of Descartes. There is a remarkable analogy between the ways in which Cabanis and Magendie considered the interdependence of physical and vital phenomena in physiology. The analysis into a partly physical and chemical and a partly vital element remained one of the most outstanding features of Magendie's physiology. He went much further than did Cabanis in realizing the importance of physics and chemistry, but his vitalism was more deeply rooted than in the prevailing

influence of Bichat. What singled Magendie out was not his conformity with, but his departure from tradition. He appears as a connecting link between idéologues proper and the physiologists succeeding him. The idéologues claimed metaphysical agnosticism, rejection of systems, and emphasis on positive facts. "Analysis" was to reveal constituent phenomena and their relations, not first or final causes. Magendie's whole life work evinces not only his insistence on facts but, above all, his striving for new facts; so that his work more and more took on the character of a mere conglomeration of exptl. results. He believed in the perfectibility of medicine when the body of extract knowledge would make medicine equal to its task. The fight for truth and limited knowledge, as opposed to vague opinion, had to go on though it implied therapeutic nihilism. This was "the scepticism which germinated into scientific medicine." Entering upon this path, Magendie stepped out of his ideological background and became the protagonist of the medical positivism of the 19th century.—*R. P. Bigelow.*

#### BIBLIOGRAPHY

2508. Atwood, A. C. Scientific publications and the indexer. *Chron. Bot.* 9(2/3): 144-147. 1945.—An appeal is made for more precise practices in the publication of scientific articles, such as the inclusion of the full name of the author, more exact and meaningful titles, care in numbering and referring to continued articles and series, and closer correlation between published articles and authors' abstracts of them.—*E. L. Core.*

2509. Avis, Kenneth. House organs as important sources of information. *Amer. Jour. Pharm.* 117(11): 400-408. 1945.—An alphabetical list of 21 house organs is given with the name and address of the pharmaceutical company publishing each. Each publication is briefly and fairly reviewed. Avis recognizes 2 main types, those intended for the physician and those for the pharmacist. Some of the former have a high scientific and intellectual standard. Unfortunately, among the latter there are some, like one described as "attuned to the intellectual level of a twelve-year-old at most," or with advertisements which are "weird modern splashes of color." A number are essentially advertising organs concerned with the merchandising of the company's and its agencies' products. Among the 21 there are several which deserve a place in the physician's or professional pharmacist's library. The 2 oldest and well-established organs are *Merck's Report* in its 54th vol. and Parke, Davis & Co.'s *Therapeutic Notes* in its 52d yr. This article is well worth consideration by one who wishes to weed out the advertising matter received and by the editors who might profit by the evaluation of their publications.

2510. MacGillavry, D. Bibliographical note. *Nederland Kruidk. Arch.* 53: 71. 1943.—Deals with the "Icones Plantarum Medicinalium, Centuria I-VI" of Johannes Zorn. A Dutch edition was issued by Sepp. The text of the latter was written by Oskamp, Houttuyn and Krauss. The last volume of the Dutch edition announces the plan to issue 2 more volumes with 200 plates. One of these volumes, with text by Adolphus Ypey, was seen by the author; it is inscribed "Vervolg op de Afbeeldingen der Artsenijgewassen, met derzelver Nederduitsche en Latijnsche Beschrijvingen". Amsterdam, Sepp & Zoon. Vol. I 1813. Vol. II also seems to have been issued, but has not yet been found.—*C. E. B. Bremekamp.*

#### BIOGRAPHY

2511. Browne, Charles A. (*U. S. Dept. Agric.*) Thomas Jefferson and the scientific trends of his time. *Chron. Bot.* 8(1): 1-64. 4 maps, 5 fig. 1943.—A monographic work on his close attention to detail in crop rotation, designing a university and its curriculum, and planning the Lewis and Clark expedition. "Jefferson had a wider knowledge of the sciences as a whole... than any [other] American of his time." Includes a series of quotations from Jefferson on the value of science.—*L. J. Gier.*

2512. Stransky, Eugene. Leopold Anton Goelis, a forgotten pioneer of modern pediatrics. *Bull. History Med.* 19(2): 226-231. 1946.—Goelis (1765-1827) graduated in Vienna in 1793, and immediately after became Head of the first dispensary for sick children, not only in Vienna, but of Europe. As early as 1800 he established the first public

dispensary on continental Europe for smallpox vaccination. In a few yrs. he vaccinated some 16,000 children. He was the first to emphasize the fact that a single vaccination does not secure a life-long immunity. In a monograph of 1808 his description of the symptomatology of diphtheria is classical. His outstanding achievement was his *Praktische Abhandlungen*... (1820) where in a classical manner he describes the onset, symptomatology, and development of tuberculous meningitis, with evidence of 2 kinds of inflammatory processes in the meninges, one characterized by exudation of pus, the second by exudation of a clear fluid.—R. P. Bigelow.

2513. Temkin, Owsei, and William T. Straus, Jr. (*Johns Hopkins U., Baltimore.*) Galen's dissection of the liver and of the muscles moving the forearm, translated from the

"Anatomical Procedures." *Bull. History Med.* 19(2): 167-176. 3 fig. 1946.—Since Galen's main anatomical work is not easily accessible to English readers, it was thought worth while to publish these translations made in the course of a research seminar. The one on the liver is from Book 6, chapters 8, 10, 11, and 12; on the muscles of the forearm, from Book 1, chapter 11. They are accompanied by explanatory notes and recent diagrams. It being generally recognized that Galen's account of the muscles is based largely upon study of the Barbary ape, *Macaca sylvanus* (*Macacus inuus*), the accuracy of Galen's description was demonstrated by dissection of the arm of a rhesus monkey, *M. mulatta*.—R. P. Bigelow.

## EVOLUTION

ALFRED EMERSON, *Editor*

(See also B. A. 21(1): Speciation in fishes, 86; Protozoan parasites, 2249; Plankton sponges, 2279; Miocene Mollusca, 2312; Evolution of isopods, 2325; Evolution of penguins, 2466; Setae in Acarina, 2336; Position of Ricinulei, 2351; Snout of lower Gnathostomes, 2419; Syndactyly in the phylogeny of the Marsupials, 2483; and in this issue—Sexual isolation in *Drosophila*, 2560; Convergent evolution in ferns, 4110; Malarial parasites, 4753; Genital ducts in Mollusca, 4791; Ammoidea, 4792; Phylogeny of Armadillidiidae, 4818; Evolution in Collembola, 4865, of Stegocephalia, 4897)

2514. Dementiev, G. P., and V. F. Larionov. The development of geographical color variations, with special reference to birds. *Proc. Zool. Soc. London* 115(1/2): 85-96. 1945.—Geographical color variations in warmblooded vertebrates, related to varying degrees of melanin deposition, are by themselves of no adaptive significance, but are a regular outward reflection of the result produced by a definite adaptive process. It is highly probable that the temp. factor will be found to be mainly responsible for all changes in metabolism occurring during the process of evolution. The influence of external factors may come into action in birds only at a definite time—at the period of feather formation. It is at this period that birds keep closely to their breeding areas. In morphogenesis the light factor probably plays a great and predominant part on these geographical variations.—A. O. Weese.

2515. Federley, Harry. Ein kleiner Beitrag zur Frage vom Kampf um's Dasein. [A small contribution on the struggle for existence.] *Memoranda Soc. Fauna et Flora Fennica* 17: 149-153. 1941.—*Pygaera nigra* and *P. curtula* (Lepidoptera, Notodontidae) were studied. Both spp. have lethal factors. One analysis gave the following result: about 25% of the eggs gave rise to larvae, 64% were killed by Chalcids and 9% failed to develop due to lethal factors. In this connection the mimicry theory is discussed, together with the struggle for existence.—William Rosén.

2516. Rensch, B. Die paläontologischen Evolutionsregeln in zoologischer Betrachtung. [Zoological considerations of the paleontological rules of evolution.] *Biol. Generalis* 17(1/2): 1-55. 1943.—Increase of size within phyletic ranges is the result of selection advantages of larger variants. Orthogenesis of single characters or organs is mostly an effect of Gandry-Cope's rule of phyletic increase in size, growth of the stipulated organ occurring mostly according to positive or negative allometry as compared with the total body size (cf. Bertalanffy, *Biol. gen.* 15). The phase of explosive form-change at the beginning of many phyletic sequences is not due to an increase of mutation, but of possibilities for selection. This holds true especially for the establishment of free biotopes. Decrease in number of free biotopes, or increase of competing forms, reduces the speed of change. Senile variation or degeneration at the end of phyletic series is mostly orthogenetic. Extinction of groups is the result of excessive specialization. Reverse mutations show that the

smallest steps in evolution are reversible, irreversibility being a consequence of complex organic change even though selective conditions are equal. Parallel and convergent evolution results from genetic similarity ("homologous variation"), or to parallel selection. The origin of new organismic types is a consequence of changed conditions of selection, not of changed mutation rate. The persistence of lower animal groups controverts the concept of an intrinsic perfection principle. All regularities of evolution are explainable by directionless mutation and natural selection. Change in environmental factors is fundamentally associated with evolutionary change. Thus evolution as a whole is not autogenesis, but is ectogenesis.—Max Onno.

2517. Seiler, J. Über den Ursprung der Parthenogenese und Polyploidie bei Schmetterlingen. [The origin of parthenogenesis and polyploidy in the Lepidoptera.] *Arch. Julius Klaus-Stift.* 18(3/4): 691-699. 1943.—Parthenogenesis occurs in the moths *Solenobia triquetrella* and *S. lichenella*. The former species has 3 forms or races: diploid bisexual, diploid parthenogenetic and tetraploid parthenogenetic. In further work with this species, Seiler develops a hypothesis which relates these forms to the glacial distribution in the Ice Age. About 3 1/2% of Switzerland remained free from glaciers. He suggests that the original bisexual form survived the ice on nunataks and has a weak tendency to parthenogenesis. Glacial conditions induced the 2n parthenogenetic form, from which the 4n form developed later. Evidence already collected shows that the 3 forms have different distributions which are in harmony with the hypothesis of their origin. One form which produces ♂♂ and ♀♀ shows facultative parthenogenesis. If a ♂ is present when the ♀ emerges copulation takes place at once; if not, the eggs are laid without fertilization and develop.—R. R. Gates.

2518. Starck, D. Die Bedeutung der Entwicklungsphysiologie für die vergleichende Anatomie, erläutert am Beispiele des Wirbeltierkopfes. [Importance of evolutive physiology for comparative anatomy, illustrated by the example of the vertebrate head.] *Biol. Gen. [Vienna]* 17(3/4): 481-510. 12 fig. 1943.—Knowledge of physiological and embryological processes is necessary for a comprehension of anatomic relations and comparative phylogeny of the vertebrate head.—Max Onno.

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 2517, 2545, 2546, 2547, 2548, 2554, 2558, 2562, 2586, 2592, 2594, 2789, 2790, 2791, 2816, 2822, 3089, 3091, 3120, 3320, 3340, 3387, 3569, 3570, 3595, 4072, 4084, 4121, 4142, 4404, 4738, 4745, 4756, 4773, 4775, 4779, 4824)

### PLANT

2519. Caldas, João Pereira. Estudos citológicos em variedades culturais de maceiras. [Cytological studies on cul-

tivated varieties of apple trees.] 48p. 6 pl., 19 fig. Published by the author: Lisbon, 1945.—Following a discussion of the literature on polyploidy and basic chromosome numbers

in apples, it is concluded that all cultivated vars. except Stark are diploids, triploids or tetraploids. A cytological study of 8 cultural vars. of *Pyrus malus* which were of interest in the program of improvement under way at the Dept. of Pomology, National Agronomic Station, Alcobaca, Portugal, is presented. Special attention is given to the relations between the process of meiosis and pollen viability. One var., Gigante do Douro, was triploid, showed irregularities in the anaphases, and had 3-5 univalents in metaphase of the 1st meiotic division. Less than 10% of its pollen germinated normally. In the var. Pardo lindo, anomalies in the heterotypic division seemed to affect neither pollen morphology nor germination. In the var. Ceboleira, with more frequent irregularities, there was a significant proportion of morphologically defective pollen grains and this var. had lower pollen germination percentages. Crosses with the triploid var. as one parent gave poor results, but all of the diploid vars. except Ceboleira may be considered good pollenizers. After dehiscence of the anthers the pollen requires a period of about 48 hrs. at the ambient temp. to reach its greatest germinative power; longer storage periods result in progressive decline.—J. L. Carlledge.

2520. Chin, T. C. (Harvard U., Cambridge, Mass.) Wheat-rye hybrids. *Jour. Heredity* 37(7): 195-196. 1 fig. 1946.—Meiosis of 2 forms of polyploid *Triticale* with  $2n = 42$ , and meiosis as well as mitosis of the developing endosperms of the amphidiploid ( $2n = 56$ ) were studied. Mitotic irregularity accounts for the poor development of the endosperms of some of the seeds.—T. C. Chin.

2521. Dangeard, P. Sur les chromosomes rattachés aux nucléoles dans les noyaux euchromocentriques et sur une distinction à faire parmi ces noyaux. [Connections between chromosomes and nucleoli in euchromocentric nuclei, and the two types of euchromocentric nuclei.] *Compt. Rend. Acad. Sci. [Paris]* 223: 253-254. 1946.—The chromatic strand, connecting the nucleolus to a chromosome, gives the positive Feulgen reaction. In "isochromocentric nuclei" of radish, lupines and *Brassica*, the  $2n$  chromocenters are nearly alike, and each represents the heteropycnotic part of a chromosome, i.e., the part from which each chromosome takes its origin at prophase. In the "oligochromocentric nuclei" of *Ricinus*, *Phaseolus* and *Cucurbita*, chromocenters are less numerous than the chromosomes, some of which therefore lack any heteropycnotic area.—J. Dufrenoy.

2522. Darlington, C. D., and E. K. Janaki-Ammal. (John Innes Hort. Inst., Merton, Eng.) Adaptive isochromosomes in *Nicandra*. *Ann. Bot.* 9(35): 267-281. 10 fig. 1945.—The 4 vars. of *N. physaloides* possess 20 chromosomes ( $2n$ ), 9 pairs of autosomes and 1 of isochromosomes, each having 2 arms with nucleolar constrictions. The isochromosomes pair at meiosis either with themselves to form univalents or with each other to form bivalents or both, and the former condition has an advantage over the latter. Loss of univalents results in pollen and eggs lacking isochromosomes. Such pollen dies, but the occurrence of seedlings lacking 1 isochromosome ( $2n = 19$ ), among others with delayed germination, shows that deficient eggs are fertilized. Pollen grains showing polymitosis were found in one diploid and binucleate pollen in another. In tetraploids with 4 isochromosomes ( $2n = 40$ ), the observed configurations and chiasma frequencies were as expected and again the "inside" pairing of isochromosomes shows an advantage over "outside" pairing. A triploid shows asynapsis of autosomes and normal pairing of isochromosomes. The suggested cause is a lack of time for completion of pairing by autosomes while the isochromosomes, with their pairing arms already attached, have considerable internal advantage of position. It is suggested that the isochromosomes are a means of survival of the species since they lead to the introduction of heterogeneous progeny from homozygous individuals. In the mutants, the delayed germination results in the distribution of progeny of a simple homozygous plant over a period of yrs.—H. P. Banks.

2523. Doutreligne, J. (Sister Christiane, Eekloo, Belgium.) Over het belang van Feulgens nucleale reactie bij het kleuren der kernen. [The importance of Feulgen nuclear reaction in the staining of nuclei.] *Natuurwetenschap. Tijdschr.* 24(6/7): 157-160. 2 pl. 1942. Nuclei of *Luffa*, *Balsamina* and *Scandix* stained with Feulgen showed that the number of prochromosomes corresponds with the number of

diploid chromosomes. In anaphase the chromosomes stained in this way were not swollen at the end as with hematoxylin.—C. A. G. Wiersma.

2524. Hagerup, O. Facultative parthenogenesis and haploidy in *Epipactis latifolia*. *K. Danske Videnskab. Selskab Biol. Meddelel.* 19(11): 1-13. 26 fig. 1945.—Every fruit contains several thousand ovules which are fertilized in very different ways. Most of the eggs are normally fertilized by a single ♂ nucleus and the embryo will then have the normal diploid number of chromosomes,  $2n = 40$ . Often >1 pollen tube enters an ovule (frequently 2-3). Therefore there will be several ♂ nuclei to carry out the fertilization. It has not been possible to observe whether polyploid embryos are formed in this way, as in *Orchis*. In about 10% of the cases investigated the ♀ nucleus begins to develop embryos without having been fertilized. Frequently another pollen tube will then arrive later which sheds its 2 ♂ nuclei in the embryo sac; but these do not function. A haploid embryo is then formed by facultative parthenogenesis, and the chromosome number of this embryo will therefore be only  $2n = 20$ . The occurrence of haploid plants in nature calls for investigation. Conditions for the degree of polyploidy that develops may also be connected with fertilization. Changes in the degree of polyploidy may arise spontaneously in nature and this may be of significance in speciation.—Auth. summ.

2525. Höfler, K. Sur la coloration vitale des vacuoles par l'Orange d'Acridine et le rouge neutre. [Staining of vacuolar solution with acridine orange and neutral red.] *Compt. Rend. Acad. Sci. [Paris]* 223: 335-337. 1946.—Acid vacuolar solns. may act as traps for ions as long as they are separated by the living cytoplasm (permeable to molecules but not to ions) from a neutral staining bath containing undissociated molecules of dye. "Empty vacuolar saps" may develop ionic coloration from basic dyes at the proper pH. Molecules, being adsorbed, dissociate into the acid vacuolar soln., yielding cations which polymerize into linear series. Conversely, "full vacuolar saps" stain irrespective of the pH, as they contain some material which may link up with the adsorbed dye. Acridine orange,  $1/10,000$  to  $1/5,000$ , imparts a copper-like fluorescence to vacuolar saps at pH above 6.6, and is a much more valuable stain than neutral red.—J. Dufrenoy.

2526. Manton, Irene. (U. Manchester, Eng.) Chromosome length at the early meiotic prophase in *Osmunda*. *Ann. Bot.* 9(34): 155-177. 2 pl., 49 fig. 1945.—One complete chromosome of *O. regalis*, measured at leptotene in a section, is  $41 \mu$ . This confirms an earlier measurement made on an acetocarmine smear. Sections from diploid plants of this species provided a number of measurable chromosomes at pachytene. They are about  $40 \mu$  in length. It is suggested that chromosome length remains constant during the early stages of pairing. Observations on late pachytene show contraction leading to subsequent supercontraction. Sections from autotriploid and autotetraploid *Osmunda* supply early pachytene chromosomes with about the same length but with a reduction in unpaired lengths (e.g., completeness of pairing is increased). Some abnormal tetraploid material shows a reduction in pachytene pairing and a subsequent failure to retain the normal spiral structure. Present and earlier measurements, taken together, show the relation of supercontracted to mitotic to fully extended chromosome length to be 1:2:4. Since this relation also characterizes the changes of length of the fibrous proteins when passing from one physical state to another, a possible similarity of mechanism is pointed out. Definitions of early stages of meiotic prophase, including recognition of 3 divisions of pachytene, are included.—H. P. Banks.

2527. Nagel, Lillian. (Harris Teachers Coll., St. Louis, Mo.) A cytological study of yeast (*Saccharomyces cerevisiae*). *Ann. Missouri Bot. Gard.* 33(3): 249-281. 8 pl. 1946.—A study of budding and sporulating yeast using a Feulgen, Robinow's bacterial Giemsa, Heidenhain's hematoxylin, brazilin, methylene blue-eosin, Flemming's triple, aceto-orcin, combined with parallel observations on living cells. Fragmentary observations of wild yeasts are included for comparison. The cytologically refractory nature of the yeast cell, due to its small size, thick cell wall, etc., has resulted in little agreement in terminology or interpretation of nuclear structure. Accordingly, to present observations uncolored by previous interpretation, a descriptive terminology



for major cell entities is adopted. The "parvicorp", the smaller body lying outside the "vacuole" and often referred to as the nucleus, appears as a Feulgen-positive, non-homogeneous, constant cell entity. Vegetative division does not appear to be typically mitotic, but in early stages of sporulation *S. cerevisiae* resembles conventional meiotic configurations. The "magnicorp", the body often called the vacuole or nuclear vacuole, was Feulgen-negative with the technique used. It is almost universally visible in budding material and enters the bud before the parvicorp, but was generally invisible in sporulating material with the above techniques. Granules in the magnicorp are not discernible in most cells with the techniques employed, but, when present, occasionally appear paired. These observations are related to the various interpretations of nuclear organization in yeast. It is suggested that the problem can finally be resolved only by correlating additional cytological investigation with further genetic and biochemical research.—Lillian Nagel.

2528. Smith, Luther. (U. Missouri, Columbia.) Haploidy in einkorn. *Jour. Agric. Res.* 73(7/8): 291-301. 1 fig. 1946.—Haploids occurred in naturally self-pollinated populations of einkorn (*Triticum monococcum*) at the rate of about 1 per 1000; in hybrid populations at the rate of up to 40 per thousand; and in populations from delayed pollinations at the rate of up to 200 per thousand. X-irradiation of pollen, in moderate doses, was ineffective in increasing the frequency of haploids. A single rod bivalent was observed at metaphase of meiosis in about 3% of the pollen mother cells of haploids. About the same proportion of the cells had a bridge and fragment at telophase. Some observations were made on the occurrence of so-called secondary pairing and the observations were interpreted as giving little support to the hypothesis that 5 is the basic number of chromosomes in wheat. Haploid plants were about  $\frac{1}{2}$  as tall as diploids, but had about the same number of tillers. Haploids produced up to 21 seeds on a single plant from natural crossing and gave rise almost exclusively to diploid progeny.—Luther Smith.

2529. Sugiyama, T. (Osaka Higher Sch., Osaka, Japan.) Studies on the chromosome numbers in higher plants. VI. *Cytologia* 13(3/4): 352-359. 35 fig. 1944.—Chromosome numbers are recorded for 2 spp. of Gesneriaceae, 2 of Lamiaceae, 1 of Scrophulariaceae, 15 of Plumbaginaceae, 5 of Guttiferaceae, 2 of Linaceae, 1 of Capparidaceae, 2 of Papaveraceae and 5 of Aizoaceae. Possible basic chromosome numbers for these families are proposed. In some families more than one basic number appears to be present.—Hans Ris.

2530. Venkatasubban, K. R. (Christian Coll., Tambaram, India.) A preliminary survey of chromosome numbers in Scitamineae of Bentham and Hooker. *Proc. Indian Acad. Sci. Sect. B.* 23(6): 281-300. 40 fig. 1946.—The chromosome numbers (diploid) determined in the present study are *Musa ensata*, 18; *Heliconia illustris*, 24; *H. aureo-striata*, 24; *H. rubra*, 26; *H. brasiliensis*, 24; *Costus elegans*, 18; *C. bicolor*, 18; *C. afer*, 36; *C. pictus*, 36; *C. musaicus*, 102? (108); *Kaempferia speeiosa*, 22; *K. atrovirens*, 22; *Curcuma zedoaria*, 64; *C. petiolata*, 64; *Hedychium angustifolium*, 52; *Alpinia sanderiana*, 48; *Amomum magnificum*, 48; *Conna edulis*, 27; *Stromanthe sanguinea*, 44; *Phrynium arundanacea*, 46; *Maranta nilida-picta*, 8; *M. roseo-picta*, 26; *M. nilida*, 26; *M. makoyana*, 26; *M. massangeana*, 26;

*M. tigrina*, 24; *M. zebrina*, 24; *M. bicolor*, 24; *M. asy-metrica*, 24; *M. lietzi*, 24; *Calathea grandiflora*, 24; *C. leitzii*, 26; *C. makoyana*, 26; *C. veitchii*, 26; *C. veitchiana*, 26; *C. lindeniana*, 26; *C. zebrina*, 26; *C. medeo-picta*, 22. A phyletic scheme showing interrelationship among the members of this order (Scitamineales) on the basis of chromosome numbers and chromosome size is included.—H. C. Eyster.

2531. Wada, B. (Imperial U., Tokyo, Japan.) Studien zur Kausalanalyse der Mitose. I. Die Mitoseablaufskurve bei den *Tradescantia*-Haarzellen. *Cytologia* 13(3/4): 323-336. 2 fig. 1944.—In 1943 Wada developed a new technique for observation of living *Tradescantia* stamen hair cells, which made it possible to follow the same cell through a complete mitotic cycle. To describe the course of mitosis, 20 clearly distinguishable stages are selected and plotted against time. This "mitosis curve" makes it possible to compare different cells in division, on an arbitrary basis. The effect of external factors, for instance temperature, on the various phases of mitosis can be graphically demonstrated. Light has an inhibiting effect on prophase, especially at higher temperatures. A light-sensitive mitogenetic substance is assumed. This may also be the basis for the daily rhythm in cell division observed in some lower plants where the meristematic cells are exposed to sunlight during the day.—Hans Ris.

2532. Warmke, H. E. (Inst. Trop. Agric., Mayaguez, Puerto Rico.) Precooling combined with chrom-osmo-acetic fixation in studies of somatic chromosomes in plants. *Stain Technol.* 21(3): 87-89. 1946.—The treatment of living excised roots in vials partially filled with water at 0°C for  $\frac{1}{2}$  hrs. before fixation in cold Benda's fluid was found to shorten chromosomes and to preserve details of chromosome morphology in a number of plant species.—Auth. abst.

## ANIMAL

2533. Harvey, Ethel Browne. (Marine Biol. Lab., Woods Hole, Mass.) Structure and development of the clear quarter of the *Arbacia punctulata* egg. *Jour. Exptl. Zool.* 102(3): 253-271. 4 pl. 1946.—A clear quarter of the *A. punctulata* egg may be obtained by centrifuging the whole egg and re-centrifuging the lighter half. This clear quarter contains the oil cap and nucleus and the greater bulk of the clear material or matrix, but none of the readily visible granules, mitochondria, yolk and pigment. If fertilized some time after centrifuging, the clear quarter-egg may develop quite normally but slowly, forming a perfect small pluteus. If fertilized immediately after centrifuging, the fertilization membrane usually breaks and the oil cap is extruded; the fertilization membrane is sometimes not formed at all but cleavages take place regularly but asynchronously resulting in a loose mass of cells. If the fertilized clear quarter remains uncleaved, the nucleus becomes greatly enlarged with one or more nucleoli and the cell often becomes amoeboid. The mitochondrial granules are not replaced during development at least to the blastula stage. Mitochondria and pigment granules are present in the plutei but are new formations. A line of fine granules can be observed with high magnification in the clear quarter separating 2 portions differing in density and in staining capacity. The important cytoplasmic material in the *Arbacia* egg is the matrix or ground substance, and not the granules.—Auth. (courtesy Wistar Bibl. Serv.).

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*  
(See also Entries 2517, 2519, 2520, 2528, 2550, 2582, 2604, 2626, 2669, 2791, 3050, 3071, 3116, 3122, 3393, 3515, 3519, 3569, 3570, 3638, 3642, 3653, 3982, 3989, 4024, 4086, 4087, 4175, 4184, 4247, 4314, 4319, 4476, 4489, 4519, 4521)

## PLANT

2534. Allard, H. A. (U. S. Dept. Agric., Washington, D. C.) Clockwise and counterclockwise spirality in the phyllotopy of tobacco. *Jour. Agric. Res.* 73(6): 237-242. 1946.—The direction of spirality of the leaves of 23,507 tobacco plants was detd., 19,406 plants of *Nicotiana tabacum*, and 4,101 of *N. rustica*. The spirality of progenies of 3 clockwise parents comprising 3971 plants, and those of 3 counterclockwise parents, 6,359 plants, was also detd. The distribution of the observed frequencies was subjected to the  $\chi^2$  tests to determine the significance of the results or goodness

of fit. The  $\chi^2$  values in all these samples indicated that the left-handed and right-handed spiralitys were in a 50:50 ratio. There appeared to be no transmission of either spirality to the progenies of selected plants. The distribution of spirality in tobacco appears to be fundamentally one of chance. The equality of ratio is an inherent condition in this plant as in a number of other plants reported upon by various investigators.—H. A. Allard.

2535. Amason, T. J., J. B. Harrington, and H. A. Friesen. (U. Saskatchewan, Saskatoon.) Inheritance of variegation in barley. *Canadian Jour. Res. Sect. C. Bot.*

*Sci.* 24(5): 145-157. 1 pl., 3 fig. 1946.—A strain of variegated barley that originated in a Saskatchewan field produces, on selfing, progeny of which approx. 90% are albino, the remainder striped or variegated with rare full green exceptions. In crosses, variegated ♀ × green ♂ produced 7 albino, 4 striped, and 11 green  $F_1$  plants. The reciprocal cross yielded 1 striped and 41 green  $F_1$  plants.  $F_2$  segregation approximated 3 green to 1 of all others (albino and variegated). From some  $F_2$  and  $F_3$  progenies it was inferred that 2 genetic factor pairs might be segregating. On that hypothesis the dominant hypostatic factor for variegation must be very unstable, mutating at a high rate to white. The peculiarities of inheritance may be explained also, however, on the basis of a combination of gene and (maternal) plastid inheritance. On this interpretation the plastids present in the egg affect the color of the seedling that develops from it. When green plastids or proplastids are present in the egg, many of them, but not necessarily all, are induced to mutate if the white  $w$  gene is homozygous, but fewer if the  $w$  gene is heterozygous. If white plastids only are present in the egg it is probable that the seedling will be an albino regardless of gene content.—*Auth. abst.*

2536. Herbert, Lamprecht von. Die Bedeutung des Xanthophylls für die photosynthetische Assimilation der Pflanze. [The significance of xanthophyll in photosynthesis.] *Bot. Notiser* 1945(1): 33-43. 2 fig. 1945.—It has generally been thought that xanthophyll is not directly necessary for photosynthesis. If it is indirectly involved, however, is more uncertain. To test the relation of xanthophyll to photosynthesis the author employed the following 4 variants as to color of pods of *Phaseolus vulgaris*: green (YY Arg Arg) ( $Y$  = gene for chlorophyll; Arg = gene for xanthophyll), gray-green (YY arg arg), yellow (yy Arg Arg), and white (yy arg arg). Crosses between green and yellow podded strains gave in  $F_2$  a 3:1 ratio. Yellow podded segregates from 2 distinct crosses had a lower average yield of seeds per plant than those from green. However, in dihybrid crosses which segregated into a 9:3:3:1 ratio, differences between the lower yield of gray-green (absence of xanthophyll) and that of yellow (absence of chlorophyll) podded plants, compared with normal green, were so slight that it is concluded that xanthophyll must participate in photosynthesis. Further comparisons of differences in yield between plants of other colors in all combinations support this conclusion.—*H. L. Blomquist.*

2537. Jenkins, Mitchell Jr. Breeding mildew resistant cucumbers. *Market Growers' Jour.* 75(10): 15, 25. 1946.—All commercial vars. of cucumbers were very susceptible to downy mildew, but some vars. from India, China and Puerto Rico showed quite high resistance. Crosses between Puerto Rican vars. and A and C have given progeny which show very good resistance. The value of these resistant vars. to commercial growers in regions where downy mildew is prevalent may be higher total yields; harvest season may be extended; production cost will be reduced due to fewer or no fungicide applications and the % of fancy cucumbers will be increased and the % of culls decreased since fruits will be produced on healthy disease-free plants with good foliage.—*E. C. Stair.*

2538. Jodon, N. E., and S. J. P. Chilton. (Agric. Expt. Sta., Baton Rouge, La.) Some characters inherited independently of reaction to physiologic races of *Cercospora oryzae* in rice. *Jour. Amer. Soc. Agron.* 38(10): 864-872. 1946.—In 17 rice varietal crosses no association was found between factors for reaction to the appropriate races of *Cercospora* leaf spot and factors for apiculus color, hull furrow color, plant color, straw vs. gold hull color, pubescence, and glutinous (waxy) endosperm. However, all possible combinations did not occur in the crosses used. Apiculus color, hull furrow color, straw vs. gold hull color, and glutinous endosperm were independent of pubescence. Glutinous endosperm was independent of straw vs. gold hull color. Linkages found between apiculus and hull furrow colors and glutinous endosperm agree with previous published reports. A 2d apiculus factor may be linked with the factor pair conditioning straw vs. gold hulls with about 30% crossing over.—*Authors.*

2539. Julén, Gösta. (Sveriges Utsädesfören., Svalöf, Sweden.) Om möjligheterna att genom självbefruktning av timotej framställa förbättrade stammar. [Possibilities of

breeding new improved strains of timothy by means of selfing.] *Sveriges Utsädesfören. Tidskr.* 52(4): 258-282. 1942.—Out of an extensive collection of timothy plants from different parts of Scandinavia and Germany, 9 plants were selected as being especially self-fertile. The progenies of these plants were studied in 4 successive I (inbred) generations as to yield, successive growth ability, earliness and rust resistance. In all tests the previous generations, grown as clones, were included. Only the most vital plants were selected for further inbreeding. Thus, out of 2432  $I_1$  plants, only 199 were selected for production of the  $I_2$  generation, and these were all originated from 35 to 377  $I_1$  plants. In spite of the very strict selection the mean yield of the population as a whole decreased with each selfed generation. 27 of the 199  $I_2$  lines and 366 out of the 2432  $I_2$  plants outyielded their P clones. The selection was shown to influence the yield of the next following generation, and with an increased effect as the number of I generations increased (corr. coeff.:  $I_1-I_2 + 0.29$ ,  $I_2-I_3 + 0.20$ ,  $I_3-I_4 + 0.48$ ). Ability for successive growth and earliness was not generally influenced by inbreeding in self-vital lines, but rust-susceptibility (*Puccinia graminis phleipratensis*) seemed to increase. Certain strains were, however, very resistant throughout. The possibilities seemed to be good for breeding of new improved stocks of timothy by means of selfing.—*J. F. Mac Key.*

2540. Keller, R. Genetika na novoi osnove. [Genetics on new principles.] *Doklady Vsesoiuznoi Akademii S.-Kh. Nauk (Proc. Lenin Acad. Agric. Sci. USSR)* 1944(10): 3-10. 1944.—An abstract of T. D. Lysenko's recent book "Heredity and its Variability," discussing the significance and timeliness of Lysenko's newly advanced principles of genetic theory to biology, plant sciences, and agriculture. The points particularly stressed are: Heredity is a concentrate or an assemblage of the environmental factors assimilated by the organism in the course of preceding generations. It is the nature of an organism to require certain conditions for its development as well as to react to different conditions of the environment. Different cells in the same organism can develop differently and therefore have different heredity. The organism is able to select those conditions which are favorable to the development of its various parts. How these effects can be transmitted depends on the degree to which the substances of the influenced parts become included in the entire chain of processes leading to the formation of reproductive and vegetative cells. These principles are admittedly at variance with the commonly accepted principles of genetic theory. However, they open the door for new investigations. They claim that heredity can be altered by grafting, crossbreeding, and by changing environmental conditions.—*S. R. Gevorkiants.*

2541. Knight, R. L. The theory and application of the backcross technique in cotton breeding. *Jour. Genetics* 47(1): 76-86. 1945.—Backcrossing has heretofore failed to produce results of economic importance in cotton breeding. Attention to 10 points has now made possible several commercially successful interspecific gene transferences. These points are: (1) the hybrid should be the ♂ parent; (2) the latest improved substrain of the backcross parent should be used as ♀ parent in each generation, to keep the program up-to-date; (3) in case of a large number of visible differences between parent species, large early backcross progenies should be grown, and severe selection made to eliminate donor parent genotype; but in case of few visible differences between parent species, as many small backcross progenies as possible per yr. should be raised; (4) selection of hybrids for backcrossing should be based solely on presence of transferred gene and vegetative resemblance to backcross parent, avoiding all characters involving heterosis; (5) backcross until a replicated test of bulk seed from heterozygotes from the backcross, against bottom recessives from the backcross, reveals equality, quantitative and qualitative, with seed from the backcross parent; and then start bulk propagation and large scale testing; (6) separate cumulative factors that have only a slight additive effect, in backcrossing, and recombine them later; (7) separate linked factors, to facilitate elimination of the intercalary donor chromosome segment; (8) disregard blending inheritance in first backcross, as clear-cut ratios may appear later; (9) bulk propagation from a backcross progeny via an out-of-season backcross  $F_2$  to an  $F_3$  homozygous propagation plot in next season; (10) use of



several  $F_1$  families for transferring genes to a strain with moderate heterogeneity.—*Bentley Glass.*

2542. Levan, Albert. (*Sveriges Utsädesfören., Svalöf, Sweden.*) Jämförande undersökning över utvecklingen av diploid och tetraploid sockerbeta och foderbeta. [A comparative study of the seasonal development of diploid and tetraploid sugar beet and mangel.] *Sveriges Utsädesfören. Tidskr.* 53(4): 215-238. 1943.—The seasonal development of diploid and tetraploid sugar beet and mangel was followed through harvesting one of the 10 repetitions on the 1st and 15th of each month during the whole vegetative period (1/6-4/11). On each occasion the analysis comprised: 1) roots: wt., water content, refraction of sap, sugar content, N content and 2) tops: wt., number of leaves, content of water, sugar, N and carotene. In another trial with a longer vegetative period (7/5-26/11) the root wt. was detd. individually in 6 repetitions. At first the wt. curves of top and root in diploids and tetraploids coincided rather well. After 3 months the wt. of the tetraploids began subsequently to be decidedly less than that of the diploids. A long growth season, however, seemed to diminish this difference as indicated by the general harvest trial. The water content seemed to be equal in the roots of tetraploids and diploids, but was evidently higher in the leaves of tetraploids. The number of leaves per individual is less in the tetraploids. The root of the tetraploids was somewhat shorter and seemed less branched than in the diploids. The sugar content and the refraction values of the roots were usually somewhat higher in diploid sugar beets than in the tetraploids during the development; the reverse was the case in the mangels, probably because the tetraploid mangels were smaller than the diploids. The tetraploids rather permanently showed a somewhat higher N content. No decisive difference in carotene content was found between diploids and tetraploids. The tetraploids were found to be more susceptible to certain diseases (*Pythium, Ramularia*).—*J. F. Mac Key.*

2543. Levan, Albert. (*Sveriges Utsädesfören., Svalöf, Sweden.*) Polyploidiförädlingens nuvarande läge. [The present state of plant breeding by induction of polyploidy.] *Sveriges Utsädesfören. Tidskr.* 55(2): 109-143. 1945.—Raw colchicine polyploids must be produced in great scale in order to make crossing and selection on old breeding principles possible. In that way the balance may be regained and improvements are feasible. Preliminary trials gave in Svalöf the following yield of the polyploids in % of the original material: red clover >100, sugar beets >100, timothy <100, white mustard 93, rye 90, barley 85, rye-wheat 85, oil turnip (*Brassica rapa oleifera*) 47, oil rape 16. Tetraploid rye and rye-wheat were transgressions in baking quality. Tetraploid mustard had a 2.5-3% higher content of crude protein but 3-5% less content of oil than the diploid. The seed-setting of tetraploid red clover was inferior to that of the diploids. Crude and digestible protein and crude fibre content was the same in diploid and tetraploid red clover, moisture some % higher in the tetraploids. Improvements seem easiest gained in low-chromosome, allogamous plants which are grown for vegetative yield.—*J. F. Mac Key.*

2544. Millington, A. J. (*Dept. Agric., Perth, Western Australia.*) Wada, a rust-resistant flax variety. *Jour. Australian Inst. Agric. Sci.* 12(1/2): 50-51. 1946.—A rust-resistant strain of flax, to be known as the var. Wada, has been selected from a field planting of the highly susceptible var., Concurrent. The new resistant var. is thought to carry the same gene or genes for resistance as carried by D. 83 and other resistant Russian vars., such as Riga Crown and Liral Crown, with which Concurrent had been previously contaminated, and which the new var. resembles in maturity, growth habit, and appearance.—*M. S. Brown.*

2545. Nielsen, Etla L. (*Agric. Expt. Sta., Madison, Wis.*) Breeding behavior and chromosome numbers in progenies from twin and triplet plants of *Poa pratensis*. *Bot. Gaz.* 108(1): 26-40. 34 fig. 1946.—Two groups of twin and triplet sets are considered. 24 pairs of twins and 2 sets of triplets (group 1) were grown to maturity from seedlings. The frequency of aberrants in progenies from 3 sets of twins was found to differ significantly. No such difference occurred among the progenies from the other 21 sets of twins or between those from the 2 sets of triplets. 46% of a non-random population (group II) of twin and triplet sets differed in morph. characteristics. No significant differences were found

in number and vigor of seedlings arising from members of multiple sets. Likewise, no difference occurred between the same characters for identical compared with dissimilar sets. The frequency of aberrant plants was significantly different in progenies from 2 of the twin and 1 of the triplet sets. The gross morphology of the predominant plant type in progenies from 7 twin and 2 triplet sets was greatly different. It is concluded from the breeding behavior and the chromosome number in plants of progenies, and from 2 sets of twins, that multiple embryos had arisen in the following ways: (1) from the egg and a synergid of an embryo sac carrying the reduced chromosome number, one member of the egg apparatus developing parthenogenetically because of the stimulative effect of fertilization of the other; (2) from 2 embryo sacs in which the eggs (or an egg and a synergid) carrying the gametophytic chromosome number had been fertilized; (3) from the unfertilized eggs, or from an egg and a synergid, of embryo sacs that arose by somatic apospory; (4) from eggs (or the egg and a synergid of one sac) of embryo sacs developed through somatic apospory, one forming a diploid embryo and the other a tetraploid by somatic doubling of the dividing zygote; (5) from 2 egg cells or from an egg and synergid that arose by somatic apospory, one of which was fertilized, the other developing parthenogenetically; and (6) from the fertilized egg derived from a reduced megaspore and from an egg of an aposporous embryo sac. The observations are discussed in relation to known breeding behavior of biotypes of the species and to the morphological and chromosomal variation in naturally occurring populations of the species.—*E. L. Nielsen.*

2546. Nielsen, Etla L. (*Agric. Expt. Sta., Madison, Wis.*) The origin of multiple macrogametophytes in *Poa pratensis*. *Bot. Gaz.* 108(1): 41-50. 18 fig. 1946.—Eggs developed following meiosis may result in haploid-diploid and diploid-diploid relationships in the plural embryos and in the mature plants. The origin of these plural embryos is (1) from 2 members of the egg apparatus and (2) from 2 megaspore mother cells. Embryo sacs developed from somatic or nucellar cells may form diploid-diploid, diploid-triploid, and diploid-tetraploid combinations of plural embryos and mature plants. The diploid-diploid combinations are considered to arise from 2 somatic egg cells or from an egg and a synergid of a single embryo sac that develop parthenogenetically. The diploid-triploid combination probably arises in a similar manner; the egg of one embryo sac develops parthenogenetically, whereas that of the 2d develops as a result of fertilization by a ♂ gamete carrying approx. the reduced chromosome number. Triploid-triploid combinations could form by the fertilizing of 2 (2 eggs or an egg and a synergid). The diploid member of diploid-tetraploid plural embryos might originate in the manner indicated previously for other combinations, the tetraploid by the parthenogenetic development of the egg with a somatic doubling of the chromosomes of the nuclear complement at the time of the zygotic division, or fertilization with an unreduced or restitution ♂ nucleus, or with a high polyploid gamete. The chromosome complement of the ♀ gamete would have to equal that of the egg nucleus. It is considered quite improbable that origin of tetraploids involving gametes would be of common occurrence. Plural embryos were found to arise from reduced megaspores and nucellar cells in the same ovule. The embryos resulting from these would be diploid-diploid or diploid-triploid, depending upon whether fertilization of only the egg of the reduced macrogametophyte or fertilization of all of the several members, reduced and unreduced, occurred. "Supernumerary embryo sacs" might develop from nucellar "bud" cells of the wall of the gametophytic cavity. These embryo sacs may be imperfect and non-functional, or they may be complete and account for some of the instances wherein proembryos or well-developed embryos are located at various positions other than at or near the micropylar portion of the seed. The observations are incomplete for such a manner of origin of plural embryos. Macrosporangogenesis in the haploid plant was quite similar to that reported for the higher polyploids of the species. The sterility of this plant is undoubtedly due to genetic rather than to evident cytologic disturbances.—*E. L. Nielsen.*

2547. Noggle, G. R. (*U. Illinois, Urbana.*) The physiology of polyploidy in plants. Review of literature. *Lloydia [Cincinnati]* 9(3): 153-173. 1946.—The paper reviews the



literature dealing with changes in the chem. composition of polyploid plants as compared to diploid plants. The following physiol. and chemical characteristics of plants were considered: growth, cell size, water content, osmotic conc., transpiration, N fractions, carbohydrate fractions, polyphenols, nicotine, organic acids, crude fat, ascorbic acid, riboflavin, pantothenic acid, carotenoids, anthocyanin, chlorophyll, enzymes, and ash components.—G. R. Noggle.

2548. Skalinska, M. (Jodrell Lab., Roy. Bot. Gard., Kew, Surrey, Eng.) Cytogenetic studies in triploid hybrids of *Aquilegia*. *Jour. Genetics* 47(1): 87-111. 3 pl., 3 fig. 1945.—Polyploid *Aquilegias* are unknown in nature. Seven 3n hybrids and their progenies from selfing and crossing with diploids and tetraploids were studied. A spontaneous triploid from *A. chrysanthemum* × *A. flabellata nana* showed formation of 0 to 7 trivalents in meiosis. Pollen size ranged from typical haploid to typical tetraploid. Pollen fertility was high; but ovule abortion was frequent, due to failure of embryo or endosperm, in most cases seemingly the latter. Artificial triploids from 4n *A. janczewskii* × 2n *A. chrysanthemum* were less fertile than the preceding type of triploid, and the trispecific triploid, *A. chrysanthemum-flabellata-longissima*, was  $\sigma$ -sterile and sterile with *A. longissima*. All triploids proved to be most fertile in crosses with tetraploids, although all but the trispecific hybrid are fertile with diploids. These results indicate preferential fertilization by n and 2n pollen grains in 2n × 3n and 4n × 3n crosses, and sole viability of zygotes from n and 2n ovules in the reciprocal crosses. Reciprocal crosses yielded similar results as to the chromosome number of offspring, but seed production was always better when the triploid parent was the male. It is noteworthy that all viable zygotes came from unions of gametes of practically the same chromosome number. A few 2n + 1 and 2n + 2 zygotes were produced, the latter arising only from n + 2 pollen grains and not from n + 2 ovules. Some of the characters of the trispecific hybrid show dominance of the *longissima* traits.—Bentley Glass.

2549. Stevenson, F. J. Breeding new varieties of potatoes. *Market Growers' Jour.* 75(10): 10, 24, 30, 35. 1946.—The complex problem of breeding potato vars. for resistance to diseases and insects is discussed. The breeding program has produced vars. and seedlings that show such characters as wide adaptation; early, medium and late maturity; smooth, desirable shapes; shallow eyes; high yielding ability and high dry matter content. Most of them are resistant to one or more of the following diseases and insect injuries: mild mosaic, latent mosaic, rugose mosaic, leaf roll, net necrosis, yellow dwarf, late blight, common scab, potato wart, brown rot, hopperburn, flea beetle, and aphid injury. Some of the new vars. in which the important objective for which they were bred has been reached are: Sebago, Empire, Placid, Virgil, Chanango and Ashworth, resistant to late blight; Minominee, Ontario, Cayuga, and Seneca, resistant to common scab; Katahdin, Chippewa, Warba, Houma, Karlaine, Sebago, Red Warba, Mohawk and Menominee, resistant to one or more virus diseases; and Teton, resistant to ring rot.—E. C. Stair.

2550. Stockwell, Palmer, and F. I. Righter. Pinus: The fertile species hybrid between knobcone and Monterey pines. *Madroño* 8(5): 157-160. 1946.—An artificial  $F_1$  hybrid population was produced at the Institute of Forest Genetics in 1927 by applying pollen of Monterey pine (*Pinus radiata*) to the receptive conelets of knobcone pine (*P. attenuata*). The 1st generation hybrids are fertile and intermediate in character as compared with the parents. The 2d generation hybrids produced by intra-population pollination are also fertile. For this hybrid form, the name *Pinus attenuata-radiata* is proposed.—Palmer Stockwell.

2551. Thomas, I., and A. J. Millington. Flax and linseed breeding in W. A.—Wada, a new rust resistant flax variety. *Jour. Dept. Agric. Western Australia* 23(2d Ser.): 39-42. 1946.—A brief description of flax growing in W. A. is given. The linseed variety Punjab could not be grown because of susceptibility to a local rust race. The var. Riga Crown was found to contain a small % of rust-resistant plants. These have served as a basis for the var. Wada. It is hoped that Wada will be released for commercial increase during 1946.—W. W. Jones.

2552. Venkataramani, K. S. Breeding brinjals (*Solanum melongena*) in Madras. I. Hybrid vigor in brinjals.

*Proc. Indian Acad. Sci. Sect. B.* 23(6): 266-273. 1 pl. 1946.—The brinjal flower is in nature cross-pollinated by insects. Emasculation is easy and the method followed is the same as that described by Kakizaki (1931). The vars. Udipi ♀ and Raviya ♂ were crossed. There was an increase in the wt. of the  $F_1$  seeds and the  $F_1$  seedlings exhibited better vigor. The  $F_1$  resembled the ♂ parent with respect to the fruit characters. The hybrids flowered earlier than the earlier parent by 18 days, and yielded more than both the parents, the increase in yield being 17.2% over the better parent and 24.1% over the poorer parent.—H. C. Eysler.

#### ANIMAL (EXCEPT MAN)

2553. Catcheside, D. G. (*Bot. Sch., Cambridge, Eng.*), and D. E. Lea. (*Strangeways Res. Lab., Cambridge, Eng.*) The rate of induction of dominant lethals in *Drosophila melanogaster* sperm by x-rays. *Jour. Genetics* 47(1): 1-9. 2 fig. 1945.—Dominant lethals were induced by 5 x-ray doses over the range from 1124-11,420 r units in Oregon-R wild type and in w mutant flies. The results checked well with those obtained by other workers, and amount, at low doses, to 12% per 1000 r for death in the embryo stage and 20% per 1000 r for death at any stage between zygote and adult. At higher doses of x-rays both rates increase, so that over the whole dose range the dose-action curve does not fit a single-hit type of action, although this is approximated at low doses. Ratio of ♀ ♀ to ♂ ♂ declines about 2.5% per 1000 r.—Bentley Glass.

2554. Catcheside, D. G. (*Bot. Sch., Cambridge, Eng.*), and D. E. Lea. (*Strangeways Res. Lab., Cambridge, Eng.*) Dominant lethals and chromosome breaks in ring X-chromosomes of *Drosophila melanogaster*. *Jour. Genetics* 47(1): 25-40. 9 fig. 1945.—Ring X-chromosomes treated with 4000 r units of x-rays were examined cytologically. Among 749 chromosomes, 23 inversions, 9 intercalations, 4 complex interchanges, and 3 deficiencies were found, but no case of a simple rod-shaped chromosome resulting from a break. There is therefore no positive evidence from this expt. that broken chromosome ends can heal. The significance of the absence of healed breaks was estimated by deriving the number of non-restituted breaks in the X-chromosome from the observed frequencies of induced structural changes in rod and ring X's and the different x-ray-induced depressions of the sex ratio in rod and ring X-chromosome stocks. It was first concluded that the chance of restitution of a break in the X was 0.74, the chance of remaining open 0.26; then, that there would be 16 primary breaks per 100 rod X's per 1000 r, or 78 per 100 sperms per 1000 r. This estimate agreed well with those based on other considerations. It was finally concluded that 3.8 non-restituted breaks were produced per 100 ring X's per 1000 r, and therefore 105 in the 749 analysed chromosomes. Since recovery of a rod chromosome from a broken ring chromosome would require simultaneous healing of both ends resulting from the break, a rate of healing greater than 0.17 per chromosome end is excluded by these data.—A terminal inversion in chromosome 2 was found, and also a complicated interchange between ring X and chromosome 3 in which a new end was provided by the ring X and the right end of 3 became intercalary. This is held to provide no support for Muller's conception of the special character of the chromosome end, or telomere.—Bentley Glass.

2555. Coster, S. Would it be a hybrid pheasant? *All-Pets Mag.* 16(17): 45-46. 1945.—A ringneck pheasant cock mated with a bantam hen. From 8 eggs, 2 hatched, the others being infertile. One lived, and resembled the pheasant more than a chicken.—W. F. Hollander.

2556. Hetzer, H. O. (*U. S. Dept. Agric., Washington, D. C.*) Inheritance of coat color in swine. V. Results of Landrace Duroc-Jersey crosses. *Jour. Heredity* 37(7): 217-224. 2 fig. 1946.—The dominant gene for white (I) previously demonstrated in the Landrace is epistatic to both black and red color. The Duroc-Jersey was thus considered to have the same color gene i as the Berkshire, Poland China and Large Black. The black spotting gene  $E_p$ , possessed by the Landrace, is dominant to the absence of black in the Duroc-Jersey, indicating that complete extension of black (E), as seen in the Large Black, partial extension of black ( $E_p$ ) as seen in the Berkshire and Poland China, and complete restriction of black (e) as manifested by its absence in the Duroc-Jersey, form a series of triple alleles with dominance

in that order. As in the Landrace  $\times$  Large Black crosses reported previously, there was no indication of linkage between  $E^p$  and  $I$ . Evidence for the existence of 2 genetically distinct kinds of white was furnished by the appearance of a few black-spotted pigs with a white background. This white is considered to represent a dilute form of red with sandy as an intermediate variation. There seemed to be no clear-cut genetic factors for the differences between white (dilute red), sandy and red. However the results could be explained on the hypothesis that there are two or three major dilution genes with white partially dominant to sandy and sandy partially dominant to red. The genotype of the Landrace was thus formulated as  $E^pE^pIID_1D_1D_2D_2--$  and that of the Duroc-Jersey as  $eeiidd_1d_1d_2d_2--$  where  $D_1d_1$  and  $D_2d_2$  represent some set of genes with white (dilute red) partially dominant. —H. O. Hetszer.

2557. Kalmus, H. (Univ. Coll., London, Eng.) Adaptive and selective responses of a population of *Drosophila melanogaster* containing  $e$  and  $e+$  to differences in temperature, humidity, and to selection for developmental speed. *Jour. Genetics* 47(1): 58-63. 1 fig. 1945.—Selection was carried out for 14 months in populations of *D. melanogaster* containing at the outset equal numbers of wild type and ebony body color genes. High temp. was found to favor the wild type, low temp. the ebony mutant type. To a less extent low humidity and selection for quick development also favored wild type, high humidity and selection for slow development the ebony type. In none of the 8 lines exposed to all combinations of the 3 variable factors was either allele eliminated. The only difference was in the speed with which an equilibrium was approached and the level of the equilibrium. These facts indicate that under all conditions the heterozygotes are superior to both homozygotes. Development of ebony flies was always slower than that of wild type under the same conditions.—Bentley Glass.

2558. Lea, D. E. (Strangeways Res. Lab., Cambridge, Eng.), and D. G. Catchside. (Bot. Sch., Cambridge, Eng.) The relation between recessive lethals, dominant lethals, and chromosome aberrations in *Drosophila*. *Jour. Genetics* 47(1): 10-24. 3 fig. 1945.—A theory is developed that radiation-induced recessive lethals are all or in very large part due to chromosome breaks. About  $1/3$  of all primary breaks induced are lethals. If the break restitutes, an ordinary lethal unaccompanied by chromosome aberration results. Large deletions, or breaks taking part in chromosome interchanges result in those lethals which are associated with chromosomal structural change. Arguments against the position-effect explanation of the latter type of lethals are given.—A quantitative theory of dominant lethals is also developed. Dominant lethals are regarded as a mixture (1) of single breaks that, having failed to reconstitute or interchange undergo sister-union, and (2) of non-viable chromosomal structural changes involving 2 or more breaks. The exptl. curve of variation with dose of yield of dominant lethals is successfully fitted to the theoretical prediction, and also the curve of the yield of viable structural changes.—The recessive lethal and dominant lethal theories are consistent with each other, as both require the same postulated number of primary chromosome breaks per unit dose (0.75 breaks per sperm per 1000 r). The alteration of the sex ratio in the progeny of irradiated  $\sigma\sigma$  with ring and rod X chromosomes is also consistent with the theory.—Bentley Glass.

2559. Southern, H. N. (Oxford U., Eng.) Polymorphism in *Poephila gouldiae* Gould. *Jour. Genetics* 47(1): 51-57. 1945.—The color of the face mask in the Gouldian finch is controlled by a single sex-linked gene, red being dominant to black. Homozygous red-headed birds have not been reported in wild populations, but possibly exist in nature. Those bred in aviaries are sometimes pathological and probably have lowered viability. Proportion of black-headed to red-headed in wild populations is approx. constant throughout the range of the species (3 or 4 to 1). Black-headed cocks and hens are about equally numerous, but red-headed cocks are twice as numerous as red-headed hens. These frequencies agree well with those expected in a random-breeding population of the observed gene ratios. Balanced polymorphism must exist in this species, under the control of a genetic mechanism like that in some Lepidoptera, except for the sex-linkage.—Bentley Glass.

2560. Wallace, Bruce, and Theodosius Dobzhansky.

(Columbia U., N. Y. C.) Experiments on sexual isolation in *Drosophila*. VIII. Influence of light on the mating behavior of *Drosophila subobscura*, *Drosophila persimilis* and *Drosophila pseudoobscura*. *Proc. Nation. Acad. Sci. U. S. A.* 32(8): 226-234. 1946.—Mating takes place with or without light in *D. persimilis* and *D. pseudoobscura*, while *D. subobscura* mates only in the presence of light.  $\sigma\sigma$  of *D. persimilis* and *D. pseudoobscura* inseminate some *D. subobscura*  $\varphi\varphi$ , the frequency of this cross-insemination being greater in the light than in the dark. *D. subobscura*  $\sigma\sigma$  inseminate some  $\varphi\varphi$  of the other 2 spp. in the light but not in the dark. Light intensity of the order of 30 foot-candles was found to be close to the optimum for mating in *D. subobscura*, but no mating and no courtship take place in this sp. in red light of an intensity which permits observation. Direct observations disclose that, in the light,  $\sigma\sigma$  of any one of the 3 spp. court about equally frequently  $\varphi\varphi$  of their own and of the other 2 spp. However, interspecific copulation occurs only seldom, and if it does the  $\sigma$  dislodges the  $\varphi$  in usually <30 sec., ordinarily before sperm ejaculation takes place.—Auth. summ.

2561. Zamenhof, Stephen. (620 W. 115th St., N. Y. C.) Studies on factors influencing mutability. Experiments with unstable genes. *Jour. Genetics* 47(1): 64-68. 1945.—The very high rate of germinal mutation in the unstable gene miniature-3a (*mt-3a*) of *Drosophila virilis* makes a study of the influence of various factors on its mutability especially informative. The effects of age and sex on mutability rate were studied. 74,259 *mt-3a* genes yielded 3649 mutants, mutability being independent of parental age, but significantly higher (1.62 times) in  $\sigma\sigma$  than in  $\varphi\varphi$ . This confirms findings of Demerec and Auerbach.—Bentley Glass.

2562. Zamenhof, Stephen. (620 W. 115th St., N. Y. C.) Studies on induction of mutations by chemicals. II. Experiments with unstable genes. *Jour. Genetics* 47(1): 69-75. 1945.—Eggs and larvae of a miniature-3a stock of *Drosophila virilis* were subjected to chemical treatments with  $\text{CuSO}_4$ , or high pH from NaOH or  $\text{NH}_4\text{OH}$ , either administered in food or by injn. 48,898 unstable *mt-3a* genes were tested and 2108 germinal mutants were found. These treatments all produced a significant decrease in mutation rate. Acid treatment was without effect. It is suggested that many physical and chemical disturbances are able to alter mutation rates, but that the direction of change will depend upon whether the gene affected is stable (increase) or unstable (decrease).—Bentley Glass.

#### MAN

2563. Bhaduri, B. N. Hereditary optic atrophy. (Leber's disease). *Calcutta Med. Jour.* 42(1): 1-4. 2 fig. 1945.—Three brothers, 11, 16, and 18 yrs., when first examd., developed optic atrophy at the age of 12 or 13 yrs. Three paternal uncles had defective vision and hearing from the age of 14 or 15. The  $\varphi\varphi$  of the family had no reported eye or ear defects but 5 sisters and 1 aunt died young. The father and 1 uncle were unaffected (family tree). Screen exam. of the 3 patients showed bilateral central scotoma (black spot in line of vision) and atrophy of the optic disc (Perimeter charts shown). Impairment of hearing accompanied the eye defect in each case. The age incidence is lower than in European reports. In published cases of Japanese families having optic atrophy, the  $\varphi\varphi$  are affected as well as the  $\sigma\sigma$ .

2564. Chown, B., Y. Okamura, and R. F. Peterson. (U. Manitoba, Canada.) The Rh types in Canadians of Japanese race. *Canadian Jour. Res. Sect. E. Med. Sci.* 24(5): 135-143. 1946.—The blood of 606 Canadians of Japanese race was tested with the 4 available antisera. Since this sample included entire families, gene analysis was based on a subsample of 217 unrelated individuals. The resulting analysis, based on Fisher's hypothesis of 8 genes, 6 pairs of allelic antigens, and 6 specific antibodies, is given, and the probable reason for a discrepancy in the findings presented and further tested. Estimates of gene frequencies in % were as follows:  $R_1$  58.00;  $R_2$  30.76;  $R'$  2.89;  $R_2$  0.40;  $r$  7.95;  $R'$  0;  $R_4$  0;  $R_5$  0. These results are compared with previous studies on Japanese, and examined in relation to Fisher's hypothesis of 3 linked loci, and Fisher and Race's hypothesis of crossing over of elementary antigens.—Auth. abst.

2565. Chown, B., Y. Okamura, and R. F. Peterson. (U. Manitoba, Winnipeg.) Inheritance of the allelomorphs of



the Rh gene in Canadians of Japanese race! A study of 65 families. *Canadian Jour. Res. Sect. E. Med. Sci.* 24(5): 144-147. 1946.—The blood of 129 parents and 182 children was tested by the 4 anti-Rh sera, anti-D, anti-C, anti-E, and anti-c (or anti-Rh<sub>0</sub>, —Rh', —Rh'', and —Hr'). The data obtained were in agreement with R. A. Fisher's hypothesis of the allelic Rh genes. No exceptions to expected results were found.—*Auth. abst.*

2566. Gates, R. R. Human heredity in relation to animal genetics. *Amer. Nat.* 80(786): 68-84. 1946.—Human heredity has 2 aspects, medical and anthropological. Racial characters and abnormalities both segregate in inheritance, but the former are generally polymeric while the latter are mutational. Many diseases and mutations, such as sickle-cell anemia, favism, Cooley's anemia and Marchiafava's disease, are also characteristic of certain races. The primary races of man are essentially species, as indicated by the paleontological record. In man the same mutational abnormality is frequently dominant in one pedigree, recessive in a 2d and sex-linked in a 3d. The dominant is usually mildest, the recessive most severe or earliest in onset, the sex-linked intermediate in symptoms. Lack of 100% penetrance indicates a weaker gene in some cases. There is thus a sliding scale of gene values from strictly dominant to recessive with low penetrance or expression. Explanations of these conditions are suggested. In haemophilia there is evidence of a milder and a more severe form, both sex-linked, and in many sex-linked diseases there is much variability of expression in the female. In certain pedigrees of bilateral radio-ulnar synostosis and epidermolysis bullosa there is evidence of crossing-over of the gene from the Y- to the X-chromosome. In many errors of metabolism the gene determines the absence of a particular enzyme, thus linking biochemistry with genetics. In many hereditary syndromes, such as arachnoidectyly and ectopia lentis, a single pleiotropic gene or two or more linked genes may be involved. A number of inherited children's diseases, such as von Gierke's glycogen disease, Gaucher's disease in which kerosin accumulates, Niemann-Pick's disease, and Morquio's osseous dystrophy, are essentially recessive lethal genes. Human genetics can thus make important contributions to general genetics.—*R. R. Gates.*

2567. Gates, R. Ruggles. Human genetics. 1518p. (2 vol. set) illus. Macmillan Co.: New York, 1946. Pr. \$15.—These volumes represent a compilation of materials pertaining to the inheritance of human characteristics. Volume I has a chapter dealing with general principles of heredity, which is followed by a chapter on human cytology and one on human linkage. The remaining Chapter headings of this volume are as follows: Eye color and hair color; Color blindness; Hereditary variations and abnormalities of the eye and ear; Albinism; Abnormalities and diseases of the skin, hair, nails and teeth; Anatomical abnormalities of the hands, feet and limbs; Abnormalities of the skeleton and of bone structure; Metabolic defects and derangements; Hemophilia; Other inherited diseases and abnormalities of the blood system; and finally, The blood groups. Volume II deals with the inheritance of allergies, various syndromes, sex and sexual abnormalities, plural births, muscular and neuromuscular abnormalities, nervous system defects, mental defects, cancer, body build, stature, and finally odds and ends. The 2 volumes are fairly well illustrated. They are rich in citations. They are planned to serve as reference volumes rather than as textbooks.—*H. H. Strandskov.*

2568. Haro, Enrique Samuel. (Stanford U. Sch. Med., San Francisco.) Hereditary disk-shaped (ring) cataract; report on a family, with microscopic examination of an eye. *Arch. Ophthalmol.* 36(1): 82-100. 7 fig. 1946.—In a family of 59 members, representing 4 generations, 16 were found to have congenital cataracts. All of the affected members presented the type of cataract known as "disk-shaped" or "ring", characterized by the absence of the lens nucleus. The absence of the lens nucleus is due either to a failure of the development of the primary fibers (Collins) or to a secondary resorption of the central parts following an idiokinetic disturbance at an early age (von Szily). This suggests the presence of genes controlling the development of the nucleus. Apparently such genes are dominant. The association of these cataracts with ectopia lentis was found in all the pa-

tients examined. No other local or systemic anomaly was present.—*E. S. Haro.*

2569. Hegglin, Robert. Über eine besondere form gleichzeitiger konstitutioneller Veränderung der Neutrophilen und Thrombozyten (konstitutionelle polyphyle Reifungsstörung). *Arch. Julius Klaus-Stiftung* 20(1/2): 1-12. 1 col. pl., 7 fig. 1945.—This anomaly of the blood cells in a father and his 2 sons differs from Reiger's anomaly and Alder's granulations, also from previous form of thrombopathy. The neutrophils and eosinophils are basophilic, the megakaryocytes become gigantic and the derived platelets are highly abnormal, resulting in a haemorrhagic diathesis. 31 normal relatives were examined. The condition is believed to be a dominant mutation.—*R. R. Gates.*

2570. Jéguier, Michel. La chorée de Huntington. *Arch. Julius Klaus-Stiftung* 20(1/2): 77-208. 26 fig. 1945.—Eight Swiss families of Huntington's chorea in Canton Vaud with 28 cases (13 ♂, 15 ♀), some going back to XVII century, confirm the dominant inheritance. There were no consanguineous marriages. The homozygous condition might well be lethal. In addition 2 single cases; one (English), with normal parents and brothers, could be a mutation. Extensive clinical observations and pathological studies of the brain lead to the conclusion that in addition to degeneration of the corpora striata there is also degeneration of the motor peripheral neurones (medullary and cranial) and frequently cerebral arteriosclerosis. In a pair of ♂ identical twins the symptoms began insidiously and almost simultaneously at the age of 41, the motor troubles being exactly the same and the movements becoming violent at 53. The literature list includes a number of early references.—*R. R. Gates.*

2571. Katzenstein-Sutro, Erich. Die Papillarmuster von Epileptikern Ost-Schweizerischer Herkunft im Vergleich mit denjenigen der gesunden Population dargestellt im Bimanuar und Dactylogramm. *Arch. Julius Klaus-Stiftung* 20(1/2): 27-50. 12 fig. 1945.—This study is based on Roll's bimanuar method in which dactylograms are produced, showing the frequency of whorls, loops and arches on the ten fingers. Many populations have been compared in this way. Author compares 800 normal men and women with 400 epileptics in eastern Switzerland. Curves are drawn in which the frequency of whorls is plotted against the frequency of arches. Graphs are given comparing these frequencies for particular fingers in both sexes and comparing normals with epileptics. Various frequency relations are pointed out. Epileptics have a higher % of whorls. It is shown how races differ in the frequency and distribution of the fingerprint patterns. There is a greater difference in the fingerprints of ♂♂ and ♀♀ in epileptics than in normals. The print distribution in epileptics is regarded as more primitive. Full references are given to the relevant literature.—*R. R. Gates.*

2572. Kloepper, H. W. (Dakota Wesleyan U., Mitchell, S. D.) Heredity of scalp whorl. *Proc. S. Dakota Acad. Sci.* 25: 44-47. 1945.—In 123 parent-offspring comparisons, the Chi-square statistic gave a value of 9.721 which is highly significant. Although the exact mode of inheritance of the trait may be in doubt, it is recommended as suitable for use in linkage studies.—*H. C. Eyster.*

2573. Lang, Theo. Zur Frage nach der genetischen Struktur von Homosexuellen und deren Eltern. *Arch. Julius Klaus-Stiftung* 20(1/2): 51-76. 1945.—In a further genetic analysis of homosexuality and intersexes in man, the author recognizes that some homosexuals are modified ♂♂ and some are modified ♀♀. His material consists of 1777 ♂ probands with 5165 sibs, and 318 with 585 half-sibs. To these families from Munich and Hamburg are added an equally extensive material of Jensch from Schleswig and Saxony. Using Weinberg's method and deducting the probands, he shows a remarkable high sex-ratio in the sibs of ♂ homosexuals. It is equally high in the half-sibs of the same father, but extremely low in the half-sibs of the same mother, showing a genetic basis. There is thus a zygotic intersexuality which shows only in a change of the sexual instincts, as well as morphological intersexes. Homosexuality is in many cases genetically determined. The author's interpretations are based on Goldschmidt's theory (from *Lymantria*) that intersexes are modified ♀♀, but in many cases they are modified ♂♂. It is suggested that the intersexes in man may be connected with polyploidy and that



the study of color blindness in homosexuals will throw light on their genetic nature.—R. R. Gates.

2574. Roy, H. K. (*Campbell Med. Sch., Calcutta, India.*) Congenital hereditary nystagmus with a case report. *Calcutta Med. Jour.* 42(6): 100-101. 1 fig. 1945.—Nystagmus (oscillation of the eyeballs) may be congenital or due to some brain defect. The author presents a genealogical tree of a family with apparently sex-linked hereditary nystagmus. Only ♂♂ were shown to be affected. Six grandsons and 1 greatgrandson of an affected maternal grandfather were all afflicted with defective vision and unsteadiness of the eye-

balls. A complete neurological exam. of the patient, a Hindu ♂, aged 20 yrs., failed to show any classical signs of a cerebellar syndrome.

2575. Schinz, H. R. Konkordanz Diskordanz und Penetranz bei eineiigen Zwillingen (Versuch einer elementaren Darstellung). *Arch. Julius Klaus-Stiftung* 20(1/2): 13-25. 2 fig. 1945.—The author develops formulae for determining the amt. of penetrance when a series of monozygotic twins show a certain degree of discordance in some of their characters.—R. R. Gates.

## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 2575, 2579, 2798, 2816, 2849, 2918, 3062, 3074, 3102, 3143, 3227, 3272, 3273, 3313, 3348, 4156, 4741)

2576. Baten, W. D., and G. M. Trout. (*Michigan State Coll., East Lansing.*) A critical study of the summation-of-difference-in-rank method of determining proficiency in judging dairy products. *Biometrics Bull.* 2(4): 67-69. 1946.—Student dairy product judges have been graded by the method of summing the differences between the ranks given by the students and those of official judges. The method is examined here by a study of the chance distribution of scores in the ranking of 7 samples in which the best possible score is 0 and the worst is 24. A score of 8 or less must be secured to give indication of real judging proficiency. Relatively good scores can be accidentally obtained in a sufficiently large number of instances to render the method of doubtful value.—J. H. Watkins.

2577. Berkson, Joseph. (*Mayo Clin., Rochester, Minn.*) Limitations of the application of fourfold table analysis to hospital data. *Biometrics Bull.* 2(3): 47-53. 1946.—The author notes the distinction between a laboratory application of 4-fold table analysis, in which 2 groups to be compared are selected before application of the technique the effect of which is to be measured, and the application of such an analysis to hospital data in which all the effects are already produced before the investigation starts. The selective factors inherent in hospitalized disease themselves may control to a significant extent the differences shown by 4-fold table analysis of hospital data.—J. H. Watkins.

2578. Cramer, Harald. *Mathematical methods of statistics.* 575p. Princeton Univ. Press: New Jersey, 1946. Pr. \$6.—This book bridges the wide gap existing in the literature between Mathematical Statistics and Pure Mathematics. In this respect the first 2 parts, "Mathematical Introduction" and "Random Variables and Probability Distributions," are particularly outstanding. The 3d and final part, "Statistical Inference," treats a necessarily arbitrary selection of questions and lacks a little of the continuity and completeness which appeals so much in the 2 earlier parts. The style and presentation throughout are clear and concise. The useful teaching device of reintroducing important topics from several aspects has been used well, thus affording necessary review. Each section leads logically to the next, many exercises for practice are provided, and the book is recommended as a mathematical statistics text at an advanced post-graduate level. Throughout the book the author presupposes a good working knowledge of the elements of differential and integral calculus, algebra, and analytic geometry. Without these a reader would be lost. In the first part, "Mathematical Introduction," 3 excellent chapters on point set theory lead to an equally good treatment of the theory of measure and integration in single- and multi-dimensional space. Particular attention is given to Borel Sets, and Lebesgue and Borel Measure. Part I concludes with a concise and concentrated treatment of Fourier integrals and matrices,

determinants, and quadratic forms. In part II Cramer develops the general theory of random variables and probability distributions. Here he first postulates various statistical definitions and axioms, and then with the aid of the mathematical theory already developed he derives the properties of single- and multi-dimensional distributions in general. He then treats each of the common distributions, e.g., Normal, Binomial, etc., in detail. Part III, Statistical Inference, deals with general notions on sampling, sampling distributions, tests of significance and theory of estimation. As can be expected in a mathematical text, the whole field of statistical inference has not been covered adequately from the point of view of a Biometrician. Nevertheless, this part succeeds very well in finally fulfilling the purpose of the book, that is, to relate the work of the French and Russian "Probabilists," such as P. Levy, A. Kalmogovaff, etc., and that of the British and American "Statisticians."—D. B. Duncan.

2579. Esser, Martinus H. M. (*U. Chicago.*) Tree trunks and branches as optimum mechanical supports of the crown. II. The branches. *Bull. Math. Biophys.* 8(3): 95-100. 1946.—Using assumptions made in a previous paper, a theory of the shapes of primary branches is developed. Two cases are studied: a primary branch which has a portion denuded of secondary branches, and a primary branch with a continuous load of secondary branches. The first case leads to hyperelliptic integrals, the second to polynomials of 2d degree.—*Auth. abst.*

2580. Finney, D. J. (*Oxford U., Eng.*) Standard errors of yields adjusted for regression on an independent measurement. *Biometrics Bull.* 2(3): 53-55. 1946.—A modified computation of the standard error of adjusted yields is described which leads to a simplification of the test for differences between adjusted treatment means. Extension to expts. of factorial design is also discussed.—J. H. Watkins.

2581. Fleisch, A. Die Berechnung der Mittelwerte in der Biologie. [Calculation of the mean in biology.] *Arch. Julius Klaus-Stift.* 18(3/4): 708-710. 1943.—Short statement regarding relations between the arithmetic and geometric mean in biology. Fuller publication elsewhere.—R. R. Gates.

2583. Snedecor, G. W., and E. S. Haber. (*Iowa State Coll., Ames.*) Statistical methods for an incomplete experiment on a perennial crop. *Biometrics Bull.* 2(4): 61-67. 1946.—An expt. on asparagus, planned for the effective lifetime of the planting, 20 yrs. or longer, had to be terminated after 10 harvestings. Statistical inferences were made as to the outcome had the expt. been continued, the horticultural aspects of which were discussed in previous papers. The present paper deals with the statistical methods used. The expt. was one of 6 randomized blocks. Forecasts of optimum cutting dates were worked out based on the total planting yield throughout its life.—J. H. Watkins.

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 2532, 2802, 2811, 2813, 3490, 3493, 3494, 3495, 3496, 3497, 3497A, 3914, 4543)

### MICROSCOPY AND TECHNIQUE

2584. Armitage, F. D. Further uses for Chlorazol black E and a new stain for botanical sections. *Jour. Roy. Microsc.*

*Soc.* 63(1/2): 14-19. 8 fig. 1943.—As a staining mountant for materials infected with molds, the author used phenol crystals, 2 parts by weight, lactic acid 2 parts, pure glycerine

1 part, and water 2 parts, to which he added sufficient Chlorazol black E to give the mixture the appearance of india ink. Since the dye takes some time completely to dissolve in the mixture, it is allowed to stand for a few days before it is used. Methods for the use of Chlorazol black E for staining paper-making fibers are also described. The new stain, Chlorazol azure G.200, was successfully used as a suspension of a lake prepared by mixing a saturated soln. of dye in water with an aqueous 6% soln. of  $MgSO_4$ , heating the mixture to 80°C, and stirring well. Sections of plant material were left in the stain for 8 hrs. or overnight, then washed with tap water, passed quickly through the alcohol series, and mounted. The colors observed ranged from blue in the nonlignified cell walls, through violet, to red in woody cells and orange in bark cells. After mixing with the  $MgSO_4$  soln., the stain loses effectiveness in 2-3 days.—*Courtesy Expt. Sta. Rec.*

2585. Blacktin, S. C. Micrometer-graticule combination for particle determination. *Chem. and Indust. [London]* 1946(15): 154. 1946.—A design is illustrated which was found satisfactory for use as a graticule only, as a micrometer only, or as combined micrometer-graticule. If the design is reproduced on glass discs of varying diams., which can be slipped in the focal planes of eyepieces of correspondingly differing diameters, it provides a choice of areas of known actual dimensions in which to count particles under the microscope.—*W. M. Holman.*

2586. Chevalier, P. (*Ecole de Brasserie, Fac. Sci., Nancy*). Un nouvel agent fixateur: Le bichromate de pyridine. *Rev. Cytol. et Cytophysiol. Vég.* 6(1/4): 221-223. 1942-43.—Pyridine bichromate is prepd. by mixing equimolar pyridine and chromic acid; filter; recryst. 2 or 3 times. It was tested on onion roots. Alone, as a 3% soln. it gave good fixation of nuclei and cytoplasm (hematoxylin). 3 g. + 5 ml. acetic acid, q.s. to 100 ml. water gives precise nuclear fixation. The cytopl. is good, but the chondriome variable. Triple staining is possible with Fe hematox. then aniline safranin (or aniline acid fuchsin), decolorized in picric alcohol; lastly light green. Nucleoli and meta- or anaphase chromosomes are red; other chromatin black; background, spindle, and membranes green. Mitochondria fix well with 10% formol for 10 days and postchromatization with 2% pyr. bichrom. in 0.5% (vol.) acetic acid; stain in Fe hematox. or aniline acid fuchsin.—*Ivor Cornman.*

2587. Cole, Elbert C. (*Williams Coll., Williamstown, Mass.*). Improved fixation in vitally stained methylene blue preparations. *Stain Technol.* 21(2): 63-64. 1946.—The present paper reports that ammonium molybdate dissolved in physiol. saline for amphibian and mammalian tissues, and in sea water for squid tissues, forms a fixing soln. that greatly reduces cellular distortion in vitally stained permanent methylene blue preps.—*Auth. abst.*

2588. Conn, H. J., and Mary A. Darrow. (*Agric. Expt. Sta., Geneva, N. Y.*). Further observations on ethyl alcohol substitutes. *Stain Technol.* 21(2): 75-76. 1946.—The conclusions concerning isopropanol and methanol as expressed in a previous article do not need to be modified after the solns. have been aged.—*E. R. Noble.*

2589. Elisei, Flavio Giuseppe. (*U. Pavia, Italy*). Osservazioni di microfluorescenza in tessuti vegetali trattati con "chelidoxantina" (berberina del *Chelidonium majus* L.). *Atti Ist. Bot. "Giovanni Briosi" e Lab. Crittogamico Ital. Univ. Pavia Ser. 4* 12: 275-302. 1940.—Transverse sections of stems, leaves, and roots of 26 vascular plants treated with chelidoxanthin demonstrated the use of this alkaloid as a stain for cellular membranes in preps. both for the ordinary microscope and more particularly for the microfluoroscope.—*E. K. Cash.*

2590. Fleming, W. D. Synthetic mounting medium of high refractive index. *Jour. Roy. Microsc. Soc.* 63(1/2): 34-37. 1943.—The author prepd. a synthetic resin of a refractive index of about 1.7-1.8 by condensing formaldehyde with naphthalene and polymerizing the product. For this purpose, 200 ml. of formaldehyde solution (formalin, 37-41% formaldehyde) are poured over 200 gm. of naphthalene. A motor-driven stirrer is desirable, but not necessary, for small batches. The mixture must be chilled in cracked ice. To the chilled mixture there is added very slowly and with constant agitation a well-chilled mixture of 600 ml. of glacial acetic acid and 300 ml. of conc.  $H_2SO_4$  (sp. gr. 1.84). The temp. of the mix is held below 10°C for the first 6 hrs. by

surrounding the container with cracked ice and by regulating the rate of addition of the acetic sulfuric acid. \*Stirring is important in this first period. After 6 hrs. at a temp. below 10°, the ice pack is removed and the temp. allowed to rise to room temperature through a period of 6-12 hrs., stirring being maintained at least intermittently. The temp. of the mix is then raised gradually in a water bath to 60°. This temp. is maintained with agitation until a sample of the yellow resin, removed and washed in water, is brittle at room temp. The mass of crude resin is washed in several changes of hot water by kneading the mass with a heavy glass rod. This washing is then repeated with 2 changes of warm 5-percent sodium carbonate soln. The mass is chilled and ground to a fine powder in a chilled mortar, with pieces of ice in the mortar to keep it brittle. The finely powdered resin is washed by decantation with cold 5%  $Na_2CO_3$  soln. and then with ice water. The powder is dried on a filter and washed with several changes of cold 95% alcohol, either on the filter or by decantation. It is further washed by kneading or stirring with a heavy glass rod in several changes of boiling 95% alcohol and finally, with 1 or 2 changes of boiling absolute alcohol. The mass is chilled, powdered in a dry, chilled mortar, washed with absolute alcohol, and dried in air. The dry resin is dissolved in pure xylene, toluene, or benzene. The soln. is diluted until a sample of the soln., chilled and filtered, develops no more precipitate upon standing at a low temp. This dilution for separation of the precipitate is most important. To the thin soln., a small amt. of anhydrous  $Na_2CO_3$  is added. The soln. is allowed to stand for at least 24 hrs. in the ice box, being shaken frequently during the early part of this period. The cold soln. is decanted and filtered through fine filter paper. The solvent is evaporated at a temp. not exceeding 100°. For ordinary use, this evaporation need not be continued beyond the point at which the resin is a moderately firm mass. Removal of the final traces of solvent is slow (especially if xylene is used as the solvent), and is necessary only if the refractive index of the pure resin is to be determined. Plasticizing the resin with 1 percent of butyl phthalate may be needed to prevent crazing and loss of adherence. The author gives this product the name "Naphrax."—*Courtesy Expt. Sta. Rec.*

2591. Gramont, Armand de. Vers l'infiniment petit. [Toward the infinitely small.] 247p. 9 pl., 55 fig. Librairie Gallimard: Paris, 1945.—A comprehensive review of the history and principles of microscopy. The chapters deal with Anton van Leeuwenhoek; the evolution of the microscope; the condenser; dark field and ultramicroscopes; binocular microscopy; the metallographic microscope; the polarizing microscope; dissociation, coloration and fluorescence; microphotography and surface conditions; statistical photography; interferences, Louis de Broglie's associated wave and the electronic microscope; bacteria, viruses, and bacteriophages; and disintegration and artificial radioactivity. The illustrations include diagrams of lines of refraction, etc., for various types of instrument.

2592. Leach, E. H. (*U. Lab. Physiol., Oxford, Eng.*). Curtis' substitute for Van Gieson stain. *Stain Technol.* 21(3): 107-109. 1946.—A triple staining method is descr. in which nuclear staining is by Weigert's hematoxylin. The cytoplasmic and collagen staining is effected by the Curtis substitute for Van Gieson, in which ponceau S is substituted for acid fuchsin. Nuclear staining is sharper than with Delafield's hematoxylin. The red of the collagen fibers is probably not subject to fading. Unlike Van Gieson, this method gives staining of reticular as well as collagen fibers. The advantages of the method are its simplicity and reliability. The use of this method is made possible by a new source of reliable samples of the ponceau S called for in this method.—*Auth. abst.*

2593. Lillie, R. D. (*U. S. Publ. Health Serv., Bethesda, Md.*). A simplified method of preparation of di-amine-silver hydroxide for reticulum impregnation; comments on the nature of the so-called sensitization before impregnation. *Stain Technol.* 21(2): 69-72. 1946.—A satisfactory di-amine-silver hydroxide soln. may be repeatedly and consistently prepared by adding 9 or 10 volumes of 10%  $AgNO_3$  soln. to 1 vol. of 28% ammonia water, running in the first 6 or 7 vols. rapidly and proceeding cautiously from then on, shaking until clear after each addition, until a faint permanent turbidity is reached. The essential nature of Gomori's iron

alum treatment and of Wilder's uranyl nitrate step following the Weigert permanganate-oxalic-acid sequence appears to be an oxidation, since the same results may be achieved with chromic acid,  $H_2O_2$ , Na iodate and elemental iodine, and since this step is better omitted on previously chromated material.—*Auth. abst.*

2594. McKay, H. H., and A. E. Clarke. (U. S. Dept. Agric., Beltsville, Md.) The use of enzymes in the preparation of root-tip smears. *Stain Technol.* 21(3): 111-114. 1946.—A simple root-tip smear method for the study of somatic chromosomes of *Allium* is descr., in which an aqueous soln. of colchicine and Pectinol, (an enzyme prepn.) is used. The root tips are placed in a 0.2% aqueous colchicine soln. for 30 min., fixed in propionic-alcohol soln., run through a graded series of alcohols, washed thoroughly, treated with a 1% aqueous soln. of Pectinol for 1 to 1½ hrs., and allowed to stand in water 3-5 days to soften. A thin transverse section thru the meristematic portion of the root tip is then smeared on a slide in a drop of propiono-carmin stain in the usual way and sealed.—*Auth. abst.*

2595. Rogoff, Wm. M. (62 Hobson Ave., East Haven, Conn.) The Bodian technic and the mosquito nervous system. *Stain Technol.* 21(2): 59-61. 1946.—Fixation of mosquitoes with Petrunkevitch's paranitro-phenol fluid with 20 or 25% formalin was found to allow use of Bodian activated protargol technic, where other commonly used fixing fluids yielded no success. Gold toning with subsequent oxalic acid reduction was found to be necessary for Culicid nerve tract prepn.—*Auth. abst.*

2596. Rosenbaum, Robert M. (4730 Centre Ave., Pittsburgh 13.) The use of clarite in preparing whole microscopic mounts. *Stain Technol.* 21(2): 73-74. 1946.—The clarite whole mount technic is similar to that involved in the use of glycerin jelly whole mounts. A cell is required for large specimens.—*E. R. Noble.*

2597. Serra, J. A. (U. Coimbra, Portugal.) Histochemical tests for proteins and amino acids; the characterization of basic proteins. *Stain Technol.* 21(1): 5-18. 1946.—A review of the more usually employed histochemical reactions for amino acids and proteic compounds in general, with several modifications which increase their sensitivity, or specificity and localization. Also a descr. of the histochemical arginine reaction by means of which proteins in general may be demonstr., and the characterization of basic and non-basic proteins can be easily accomplished. The application of protein histochemical tests for quantitative purposes is discussed.—*E. R. Noble.*

2598. Spitzer, H. (Drug House of Australia, Ltd., Roselle, Sydney.) Silica gel for preservation of plant material. *Australian Jour. Sci.* 8(2/3): 83-84. 1945.—Silica gel provides material whereby moisture is removed from fresh plant material without harmful effects of other methods of dehydration. Under static conditions, equilibrium is attained which is a function of original relative humidity, the temp., and the quality of silica gel per unit of space. If suitable conditions are chosen, an equilibrium can be made to correspond to a low relative humidity and extensive use of this property has been made in tropic-proof packaging of a variety of goods. Silica gel may be reactivated by a heat treatment.—*L. A. Miller.*

2599. Van Fleet, D. S. (U. Missouri, Columbia.) An oxidation and adsorption reaction for differentiating the endodermis and the collenchyma. *Stain Technol.* 21(3): 95-98. 1946.—The exclusive oxidation of the leuco (reduced) form of common redox indicators to the oxidized and colored form by the endodermis may be induced by treating fresh free-hand or freezing microtome sections with various alkaline salts at pH 8.5 to 9. The endodermis and the collenchyma may be differentiated best by oxidation and adsorption respectively by means of Na selenite, guaiac and glycerol in the order given. The collenchyma in roots has not been defined to date, and the reactions descr. introduce a new

method of study for this tissue. By treating sections with boric acid a gradient in the guaiac reaction appears in the cortex.—*Auth. abst.*

2600. Voigt, Robert. (U. Frankfurt, Germany.) Die Kreismessermethode, ein neues Verfahren zum Schneiden tierischer und pflanzlicher Stoffe. [The circle knife method, a new method for cutting animal and plant materials.] *Hoppe-Seyler's Zeitschr. physiol. Chem.* 281(1/2): 1-6. 2 fig. 1944.—The apparatus for preparing tissue slices is made from an old sliding microtome, the knife being a circular saw blade, 8-15 cm. in diam. The tissue is fastened to a cork with gelatin, and is moved against the rotating circular knife. The thickness of the tissue cut is controlled by a micrometer screw. The lower part of the knife passes through a Petri dish filled with Krebs's nutrient soln., in which the tissue slices are collected. Tissue slices as little as 0.2 mm. in thickness can be cut without being torn or crushed. From the slices, circular pieces of the desired size can be cut with cork borers, and the volume of tissue used in an expt. thus readily calculated. The respiration of the tissues is defined by the equation:

$$Q_{O_2} = \frac{\text{cmm } O_2 \text{ used}}{10 \text{ mg. fresh tissue per hr.}}$$

The wt. of the tissue used is detd. by multiplying the tissue vol. by the specific wt. of the organ. About 100 mg. of rat, kidney, liver, spleen, etc., are used for a detn. The absorption flask contains 50% KOH, and the expts. are carried out 1-12 hrs. For each tissue, the same number of slices, having the same thickness and the same surface area, use the same amt. of  $O_2$  during the same time. In expts. in which slices of the same thickness but with a surface area in the ratio 1:2:3 are used, the  $O_2$  consumption increases in proportion to the surface area, but  $Q_{O_2}$  remains constant. In respiration expts. of 8-12 hrs. duration, it is better to use tissue slices 0.5-0.6 mm. in thickness, for the  $O_2$  quotient decreases more rapidly with thin than with thick slices.—*A. B. McCoord.*

2601. Anonymous. Phase microscope. *Indust. Equip. News* 14(9): 107. 1 fig. 1946.—The manufacturers announce the development of a new light-control diffraction plate which may be applied in the objective lens of Spencer microscopes to permit study of transparent living cells, tissues, microorganisms and industrial materials. The plate makes detail visible by increasing, reducing or reversing contrast in the image formed by the microscope. Source: American Optical Co., 12 Mechanic St., Southbridge, Mass.—*M. A. Raines.*

## PHOTOGRAPHY

2602. Martin, V. G., and J. Ansel Anderson. (Grain Res. Lab., Bd. Grain Comm., Winnipeg, Manitoba, Canada.) Apparatus and technique for photographing grain kernels and similar objects. *Sci. Agric. [Ottawa]* 26(9): 419-425. 5 fig. 1946.—Apparatus and technique are described for photographing grain kernels, insects, and other specimens of similar size. The camera consists of a cast bronze cone with a lens mounted in a threaded tube for focusing on a ground glass. Good photographs of kernels and insects were obtained with Tri-X Panchromatic film developed in Edwal Super-20 developer. Correct lighting is important to obtain detail and variations in tone. For colour photography, colour temperature of the lamps and exposure time must be detd. accurately.—*V. G. Martin.*

2603. Anonymous. Light source for photographing. *Indust. Equip. News* 14(1): 79. 1 fig. 1946.—For microsecond exposure. Provides high-intensity illumination for 2 microseconds upon actuation by making or breaking an external contact, by pressing a button, or by a sound impulse on a microphone. Source: General Radio Corp., 273 Massachusetts Ave., Cambridge 39, Mass.—*M. A. Raines.*



## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries—Rh types in Canadians of Japanese ancestry, 2564, 2565; Fingerprints in normals and epileptics, 2571; Primitive medicine, 2667; Forest communities due to activity of prehistoric man, U. S. 2728; Reproductive cycle of Chacma baboon, 3143; Cardiovascular disease in African Negroes, 3233, 3234, 3235; Abnormal T waves in patients without cardiac disease, 3280; The Rh factor, 3638; Diagram of Rh blood types, 3641; Rh blood group factors (review, 3642)

2604. Altmann, A., and E. Gaynor Lewis. Rhesus blood groups in South African Europeans and South African Bantu. *S. African Jour. Med. Sci.* 10(4): 137-140. 7 fig. 1945.—224 Bantus of mixed tribes were Rh-tested with 2 Anti-Rh sera giving 84.5% and 70% positive reaction, respectively, with S. African Europeans (i.e., Anti-Rho and Anti-Rh' serum, respectively). Only 5% of the Bantus failed to react with both sera, as against 13.5% Europeans. But, while 70% of the Europeans reacted with the Anti-Rh' serum, only 18.5% Bantus showed this reaction, indicating that the Rh' Gene is much rarer in the Bantu. Unfortunately, no Anti-Rh' serum was available to determine whether the Rho Gene or the Rh' Gene is more prevalent in the Bantu.—*Authors.*

2605. Cluver, E. H., and E. Jokl. (Nation. Advisory Council. Phys. Educ., Pretoria, S. Africa.) Growth patterns as secondary sex characteristics. *S. African Jour. Med. Sci.* 10(3): 105-107. 1 fig. 1945.—The substance of this paper is an elaborate graph in which the S. African standard Grids of Growth, of Height and Weight of S. African boys and girls of European descent 6-18 yrs. of age are superimposed. This graph reveals that growth patterns are distinct secondary sex characteristics; the girls are less tall and do not weigh as much as the boys. Only during puberty, which the boys reach 2-4 yrs. later than do the girls, is there a temporary reversion of the above state.—*Authors.*

2606. Cluver, E. H., E. Jokl, and P. R. Rorich. (Nation. Advisory Council. Phys. Educ., Pretoria, S. Africa.) Physique of American, Canadian, English and South African school children. *S. African Jour. Med. Sci.* 11(1): 45-49. 1946.—With the help of the standard grids of growth of S. African school children which were presented by Cluver and Jokl, an analysis was undertaken of mean H and W measurements of American, Canadian, English and S. African boys and girls. The H means for all ages between 6 and 15 yrs. of the S. African children are superior to those of American, Canadian and English boys. With the exception of the mean figures for ages 8 and 9, the same statement applies to the S. African girls. The S. African and Canadian boys are heavier than the American and English boys. By superimposing the median channels of Wetzel's American upon those of the S. African height-weight grids, it is revealed that for a given H the American children, whom Wetzel has studied, tend to be bulkier than the S. Africans, notwithstanding the fact that the latter are, for most ages, taller and heavier.—*Authors.*

2607. Cummins, Harold (Tulane U., New Orleans, La.), and Vibeke Fabricius-Hansen. (U. Inst. for Res. in Human Genetics, Copenhagen, Denmark.) Dermatoglyphics in Eskimos of West Greenland. *Amer. Jour. Phys. Anthropol.* 4(3): 395-402. 1946.—Finger prints and palmar dermatoglyphics of 145 Eskimos of West Greenland are analyzed. All variants exhibit trends which are characteristic of Yellow-Brown stock. Three factors must be considered in explanation of the inconsistencies among the several recorded series of Eskimos: small size of the available samples; influences of racial admixture; inclusion of family members, which may have brought about departures from the characteristics of random samples.—*Auth. (courtesy Wistar Bibl. Serv.).*

2608. Gerry, R. G., and R. E. Sanston. Congenital mandibular deformities in new-born infants. *Amer. Jour. Orthodont. and Oral Surg., Oral Surg. Sect.* 32(7): 439-444. 8 fig. 1946.—Congenital mandibular deformities in new-born infants have been very infrequently described. A careful oral examination was made of 60 new-born infants and it was found that 12 of them had deviated mandibles. All of these deliveries were normal and the obstetricians could offer no history of pressure applied to the mandible. In each case there was a variation of the mandible from the normal horiz. plane as well as to the right or left with the greatest distance between the mandible and maxilla occurring

on the side toward which the mandible was deviated. In all cases a hand or foot could be placed in juxtaposition to the indented defect of the mandible so that it fitted into the deformity. All babies had normal mandibular movements with satisfactory right and left lateral excursions and there was no difficulty in nursing or feeding. Evidence shows that there is a deviation of the mandibles in 20% of the new-born infants. The deformities are due to intrauterine pressure and not to a genetic disturbance as is evidenced by the fact that only one of identical twins had this defect. In all cases the deformities were corrected spontaneously by the end of the 10th week.—*D. C. Lyons.*

2609. Hrdlička, Aleš. (Smithsonian Inst., Washington, D. C.) The anthropology of Kodiak Island. 486p. 228 fig. Wistar Institute of Anatomy and Biology: Philadelphia, 1944.—This volume is based upon the literature and upon expeditions to Kodiak Island in 1931-1937. There are chapters on historical data, and excavations and surveys, and on the physical anthropology of the Koniags. There are Appendices on stone and bone artifacts and on animal and plant life. The living Koniags av. 159 cm. in stature (♂) and are brachycephalic. They are similar to, but not identical with, the phys. type of the Bering Sea Eskimo. H. measured 85 ad. K. crania (50 ♂, 35 ♀) Av. L is ♂ 176 mm., ♀ 168 mm. Av. B is ♂ 151 mm., ♀ 145 mm. CI is ♂ 85.9, ♀ 86.5. The K. crania are like the Aleut in the face, but not in the vault. H. concludes: "We are, of course, not dealing with separate races of man in the case, but only with racial groups in a minor sense of the term, in which numerous resemblances must be expected." The K. are no nearer the Alaska Indians than they are to the Eskimo. H. reports also on 175 ad. Pre-Koniag crania (65 ♂, 110 ♀). "The Pre-K. were an important and a homogeneous group, with some Mongoloid, Eskimoid and Indian affinities, but with so far as known, no geographically, culturally or physically close relatives." Av. L is ♂ 180 mm., ♀ 173 mm. Av. B is ♂ 140 mm., ♀ 135 mm. CI is ♂ 77.6, ♀ 78.2. A. reports also on the long bones of both the K. and the Pre-K.—*W. M. Krogman.*

2610. Hrdlička, Aleš. (Smithsonian Inst., Washington, D. C.) The Aleutian and Commander Islands and their inhabitants. 630p. Map, 239 fig. Wistar Institute of Anatomy and Biology: Philadelphia, 1945.—This volume is based upon information in the literature and upon expeditions to the Islands in 1936-1938. There are chapters on historical data, ethnographic traits, cave excavations and surveys, archaeological material, and physical anthropology. Living Aleuts are short (♂ av. is 5' 3"); skin color is med. to lt. brown; hair is st. and black; heads and faces are broad, never long; eyes are dk. brown; cheek bones are prom.; nose is mod. broad. "The whole aspect of the people was that of Mongoloid Asiatics, with the basic characters at the same time American." H. gathered 228 Aleut crania (♂ 113, ♀ 115). Av. L is ♂ 180.5 mm., ♀ 172.5 mm. Av. B is ♂ 150.7 mm., ♀ 144.7 mm. CI is ♂ 83.5, ♀ 83.9. Cran. cap. is ♂ 1537 cc., ♀ 1368 cc. A number of long bones are also reported on. H. does not classify the Aleut cranial type with the Eskimo. He does equate the Aleut cranial type with that of the Koniags, especially on the basis of a possible common ancestor. The Aleut-Koniag type is close to that of the Tungus. H. reports on 57 ♂ and 64 ♀ pre-Aleut crania. Av. L is ♂ 186.9 mm., ♀ 178.8 mm. Av. B is ♂ 142.6 mm., ♀ 138.2 mm. CI is ♂ 76.3, ♀ 77.3. Cran. cap. is ♂ 1502 cc. (?) and ♀ 1306 cc. (?). The pre-Aleut ♂ are ca. 5' 5". H. feels that the pre-A. are a diff. "strain" from the Aleuts, the Eskimo, the pre-Koniags, and that their crania show an "affinity" with the continental Sioux.—*W. M. Krogman.*

2611. Lasker, Gabriel Ward. (Wayne U. Coll. Med., Detroit, Mich.) Migration and physical differentiation. A comparison of immigrant with American-born Chinese.

*Amer. Jour. Phys. Anthropol.* 4(3): 273-300. Map. 1946.—Measurements of Chinese ♂♂ born and raised in the U. S. differ in certain specific respects from those of Chinese immigrants born in China. These differences consist in an increase in stature and in all measurements highly correlated with stature: notably all measurements of the trunk and limbs other than chest depth. Of the body indices, the thoracic, brachial, hand and foot indices tend to be lower in the American-born. Similar tendencies have been noted for Chinese and Japanese born in and immigrant to Hawaii. The typical Oriental youth born and brought up in the U. S. or Hawaii, when compared with immigrants from the region from which his ancestors have come, differs in ways which may be ascribed to an "environmental growth factor." He is taller with longer arms and legs, relatively slenderer hands and feet and flatter chest. His head is likely to be shorter but broader and his nose to be relatively narrower. He has more body hair. Such changes are exemplified in Chinese in America and seem to signify a process caused by changed dietary factors, or otherwise, attendant upon the migration of peoples.—*Auth. (courtesy Wistar Bibl. Serv.)*.

2612. Lipschutz, Alexander, Grete Mostny, and Louis Robin. The bearing of ethnic and genetic conditions on the blood groups of three Fuegian tribes. *Amer. Jour. Phys. Anthropol.* 4(3): 301-317. 5 pl. 1946.—A careful inquiry made into the ethnic condition or "genetic" antecedents of each of 77 individuals belonging to the Fuegian tribes—Onas, Yamanas and Alakalufs—or related to these by one parent or grandparent. These 77 individuals represent about 40% of the total indigenous Fuegian population. Only 34 were separated as seemingly free from white antecedents. The blood group distribution of these 77 individuals is much the same as in most American populations composed of Indians and Indian-White crosses. Thus 58 individuals, or 75% were group O, and the remaining 19 individuals were non-O. The same is true for each tribe considered separately. All the 34 individuals sorted as free from white antecedents belonged to group O, whereas all the 19 individuals who belonged to non-O groups were shown to have white antecedents among parents, grandparents or great-grandparents.—*Auth. (courtesy Wistar Bibl. Serv.)*.

2613. Meredith, Howard V. Physical growth from birth to two years. II. Head circumference. Part 1. A review and synthesis of North American research on groups of infants. *Child Development* 17(1/2): 1-61. 1946.—This paper presents a colligation of data dealing with the head circumference of infants obtained from 39 investigations dating from 1850 to 1945. Intercomparisons and generalizations are derived on head girth in relation to age, sex, lineage, socio-economic status, secular period, diet, disease, prematurity, birth molding, and birth order.—*Elizabeth Hyde*.

2614. Meredith, Howard V., and E. Matilda Meredith. (U. Iowa, Iowa City.) The body size of South African Negroid schoolboys compared with North American schoolboys of White, Mongoloid, and Negroid stocks. *Amer. Jour. Phys. Anthropol.* 4(3): 377-388. 1946.—Le Riche, in 1944, reported "A Somatometric Study of South African Bantu School Children." The means on ♂♂ from this study are aligned with comparable means from a number of N. American studies. For wt., arm circumference, and hip width comparisons are made between S. African Bantu schoolboys and N. American schoolboys of Chinese, Negro, Italian, and Northwest European descent studied during the decade 1930-39. For stature, the comparisons are extended both racially (to include groups of Japanese, Navaho Indian, Mexican, Polish, Irish and Dutch ancestry) and secularly (to include samples drawn prior to 1900).—*Auth. (courtesy Wistar Bibl. Serv.)*.

2615. Sarkisian, Sarkis S. The specific gravity of healthy men. *U. S. Naval Med. Bull.* 46(8): 1207-1211. 1946.—The specific gravity of the human body is said to be the most accurate single measure of physical fitness. It is, however, difficult to determine. Behnke, Feen and Welham (1942) showed, in 99 ♂♂, that there was a close relationship between specific gravity and the diff. between the circs. of the chest and the abdomen. S. tests this correlation in 835 ♂♂, the majority being drawn from submarine personnel. The method used for determining specific gravity is that of Behnke

et al. (details not given). The correlation is confirmed for specific gravities between 1.04 and 1.09, sp. gr. increasing with the diff. between the thoracic-abdominal circumferential measurements. Not enough data were available for specific gravities below 1.04 and above 1.09 the curve flattened out. In his summary, S. suggests a sp. gr. of 1.055, corresponding to a circumferential diff. of 5.1 inches, as the dividing line "for determining the physical fitness of men for deep-sea diving and submarine duty."—*E. A. Bliss*.

2616. Seltzer, Carl C. (Harvard U., Cambridge, Mass.) Chest circumference changes as a result of severe physical training. *Amer. Jour. Phys. Anthropol.* 4(3): 389-393. 1946.—The effect of a severe physical training period on chest circumference measurements was studied in the case of 272 aviation cadets. The results showed a general increase of the chest circumference as a result of the training period. This was not considered to be a reflection of any skeletal modifications, but due rather to a greater development of the thoracic musculature and increased tonus of these muscles. Gain in chest circumference was evidently no criterion of improved physical fitness.—*Auth. (courtesy Wistar Bibl. Serv.)*.

2617. Shanklin, William M. (Amer. U. Beirut, Beirut, Lebanon.) Anthropometry of Transjordan Bedouin with a discussion of their racial affinities. *Amer. Jour. Phys. Anthropol.* 4(3): 323-371. 4 pl. 1946.—15 measurements and numerous observations were made on 70 Howaitat and 65 Beni Sakhr ♂♂. In their observable features they are very similar to the Syrian Bedouins (Rwala, Akeydat, Maualy). They usually have medium or light brown skin, dark brown eyes with variations as light brown, gray brown and blue brown, and high straight noses. The measurements and indices show that the Howaitat and Beni Sakhr are very similar, furthermore they are both morphologically like the Rwala. All 3 groups have very low statures (mean 163 cm.) and are small featured. In sharp contrast the neighboring Akeydat and Maualy are tall (mean 169 cm.) and large. A statistical comparison shows these tall tribesmen are similar in size to a number of tribes in the Rif. The writer suggests that there are 2 varieties of the Mediterranean race living in the Transjordan and Syrian deserts. One variety, represented by the Howaitat, Beni Sakhr and Rwala, is short-statured and small featured. These perhaps belong to the Mediterranean race proper described by Coon, 1939. The other variety, represented by the large featured Akeydat and Maualy show a marked similarity to the Sheshawen and the Rif Arabs of Morocco. These tall Syrian Bedouin may belong to the Atlanto-Mediterranean race which includes most of the peoples of northwest Africa.—*Auth. (courtesy Wistar Bibl. Serv.)*.

2618. Siedentopf, A. R. Africa's cave folk on a new trail. *Nat. Hist. [New York]* 55(7): 332-336. 7 fig. 1946.—When the tribe of Watindiga was discovered 17 yrs. ago in northern Tanganyika, their stone implements and houseless home-districts indicated they might be survivors of the Stone Age. When 22 of 25 children died in severe inclement weather, the author urged the District Commissioner to homestead them on an abandoned irrigated farm. Some trials of this enterprise are described. Now about 200 of the 400 tribesmen have accepted the new mode of living, and survival of the tribe seems assured. Already they are losing some of their ancient folklore and customs.—*G. H. Kelker*.

2619. Wissler, Clark. (Amer. Mus. Nat. Hist., N. Y. C.) Man and his baggage. *Nat. Hist. [New York]* 55(7): 324-330. 8 fig. 1946.—From material in the museum, the individual items that comprise the baggage of a family unit were weighed for 3 geographical types of mankind. The aboriginal ♀ native of central Australia carried 12 lbs. on her person, and the male carried 21 lb. or 33 lbs. per pair when not carrying a baby. The Plains Indians of 1840 had essentially same baggage as of 1540. The total tipi with household and personal effects weighed 447 lbs. Substitution of horse for dog by 1540 to drag the travois increased number and size of movable possessions. The Siberian nomads using reindeer for pulling sleds average 2000 lbs. per family of moderate means. Hence the ratio that exists among primitive people as to baggage and way of life seems bound to continue into the future for civilized people.—*G. H. Kelker*.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; Geriatrics; and: B. A. 21(1): New periodical 28; New Rh allele, 97; Racial incidence of liver cancer, 830; Syphilis incidence in Negro high school, Baltimore, 1393; and in this issue—Health of the American People, 2505; Hematologic data on college women, southern U. S., 2847; Congenital (?) cretinism with goiter, 3127; Cardiovascular disease in African Negroes, 3233, 3234, 3235; Hashish, 3336; Social distribution of cancer of scrotum and penis, 3392; Racial incidence of carcinoma in Orientals and Africans, 3407; Psychotic sequelae of malaria 3434; Psychoneuroses and World War II, 3445; Mental hygiene in the light of war experience, 3451; Supernumerary teeth in Southern Nigeria, 3461; Racial immunity to tuberculosis, India, 3629; The Rh factor, 3638; Diagram of Rh blood types, 3641; Rh blood group factors (review), 3642)

## POPULATION, FERTILITY, VITAL STATISTICS

2620. Beall, G., and R. G. Stanton. The relationship between epilepsy and maternal age. *Human Biol.* 18(1): 49-60. 1946.—Patients in 2 Ontario Hospitals, devoted particularly to epileptics and mentally defectives, were studied with regard to the age of their mothers at delivery. For mothers in their late forties the chance of a birth being that of an epileptic, moronic to normal, is 4 times as great as for mothers in their twenties. So far as idiots (exclusive of mongols) are concerned, the chance of epilepsy seems independent of maternal age. The relationship for epileptics of some intelligence is reminiscent of that obtaining for mongols although on a more moderate scale. The curious modification with level of intelligence in the relationship is not understood.—G. Beall.

2621. Cook, Robert. (306 Victor Bldg., Washington, D. C.) Genic and cultural erosion in America. *Jour. Heredity* 37(3): 74-80. 1 fig. 1946.—Data from the 1940 Census and research reports are used to highlight the tragic effects of differential birthrates in the U. S. A. Of especially menacing significance in a democracy are the tendencies for the well educated, and those who improve their economic status, not to maintain a replacement birth rate.—L. M. Dickerson.

2622. Corsini, Raymond. Season of birth and mental ability of prison inmates. *Jour. Social Psychol.* 23(1): 65-72. 1946.—The I. Q.'s of 1,030 white and 365 Negro inmates of Auburn Prison were studied as to date of birth to determine whether any monthly or seasonal differences in average I. Q. existed. For the white prisoners the largest average I. Q. occurred for January births. The largest quotients for Negroes occurred for July births. The differences are not statistically reliable. (Critical ratios are all <3.) The investigator doubts that seasonal differences exist.—C. W. Telford.

2623. Davis, Kingsley, and Ana Casis. (Princeton U.) Urbanization in Latin America. *Milbank Memorial Fund Quart.* 24(2): 186-207. 5 fig. 1946.—Latin America is urbanized to a high degree for the present stage of industrial development. Uruguay, Argentina and Chile in the order named are more highly urbanized than France or Canada and come close to the United States although the metropolitan tendency has not gone very far. The reason would seem to be migration from the inaccessible and undeveloped interior to cities having more cultural, economic and political advantages. Special reference is made to Argentina, whose rural population dropped from 32% in 1930 to 26% in 1938.—E. K. Kline.

2624. González Cortés, E. La medicina social en las cardiopatías. [Social medicine in the cardiopathies.] *Rev. Med. Chile* 74(4): 275-279. 1946.—Suggestions are made in this article for the manner in which the agencies of social medicine in the country, such as the "Instituciones de Previsión Social", the organizations of "Beneficiencia Pública", and the "Dirección General de la Protección de la Infancia", can organize the struggle for the prevention and treatment of cardiopathies. In this struggle they will have to combat effectively rheumatism, lues and other infections, and the degenerative diseases, as hypertension and arteriosclerosis. For this purpose the creation of centers in connection with the polyclinics and hospitals, well equipped for diagnosis and treatment, is suggested. The social insurance of 5% on incomes will be the source of financing such centers. An important phase of the work will be the reassignment of persons with cardiopathies to other types of work and the aid to these people in their necessary readjustments. The agencies concerned with this phase are listed. Such care

will decrease the degree of real invalidism and make it less likely that persons suffering from heart impairment will become burdens to themselves, to society, and to the state.—Warren Andrew.

2625. Hervé Luis, L. Las enfermedades cardiovasculares en la Caja de Seguro Obligatorio. [The cardiovascular diseases among those under obligatory social security.] *Rev. Med. Chile* 74(4): 261-266. 1946.—The proportion of those ill of cardiovascular disease among the workers varies around 4.5% of the total of those insured. Actual cardiac insufficiency is present in 20% of these and rapidly brings about a permanent invalidism, especially in those who have heavy tasks. The "Law of Preventive Medicine" of Chile aids in the early diagnosis of cardiovascular disease and also in the treatment of cardiac insufficiency; but its economic-social measures can be applied only to a late phase of the cardiopathies, so that the really preventive aspect of the law is not pronounced, and its benefits not too evident. There should be a better means of prevention of cardiac insufficiency itself. The early change of occupational task appears to be a fundamental necessity, but this cannot, as yet, be carried out as effectively as it should, chiefly because of economic and legal reasons.—Warren Andrew.

2626. Jenny, Ed. Umwelteinflüsse auf Geburtenzahl und Knabenüberschuss. [Environmental influences on number of births and on sex ratio at birth.] *Arch. Julius Klaus-Stift.* 18(3/4): 714-718. 3 fig. 1943.—The normal sex-ratio at birth is taken as 105 ♂:100 ♀, and at conception 146:100. Anything which reduces the prenatal losses will then raise the sex-ratio. Nine months after the 2d mobilization (May, 1940), the sex-ratio at birth rose to 115. The ratio is higher for legitimate than illegitimate children, and for first than later children. The 1st mobilization had no such effect, probably because the shock and increased work for the women led to more miscarriages. From 202,224 births it appears that more boys are born in the afternoon and morning, more girls about midnight or midday. The positions of sun and moon are found to have opposite effects on the number of births and on the sex-ratio.—R. R. Gates.

2627. Kimoto, Blanche, and H. W. Kloefer. (Dakota Wesleyan U., Mitchell, S. Dak.) War's effect on birth ratio. *Proc. S. Dakota Acad. Sci.* 25: 11-14. 1945.—Objective data before and during the war were obtained concerning the actual number of ♂ and ♀ births from the Methodist State Hospital in Mitchell, S. D. and from the State Board of Health at Pierre, S. D. 104.8 ♂♂ were born for every 100 ♀♀ before the war, and 105.3 ♂♂ were born for every 100 ♀♀ during the war. The difference is shown not to have any statistical significance.—H. C. Eyster.

2628. Landis, C., and Jane E. Farwell. (Columbia U.) A trend analysis of age at first-admission, age at death, and years of residence for state mental hospitals: 1913-1941. *Jour. Abnormal and Social Psychol.* 39(1): 3-23. 1944.—The essential statistics in this study are presented in the form of 9 graphs. It is a trend analysis based chiefly on the records of the New York State Mental Hospitals, although figures from Massachusetts and Illinois are cited as showing similar trends. In spite of the increase in hospital beds, and in the rate of hospitalization of the aged, there has been no major increase, or decrease, in the rate of first-admissions to the mental hospitals during the last 29 yrs. The median age at first-admissions has increased from 39.9 in 1913 to 48.8 in 1941. This is true for each of the separate diagnoses of all psychoses except dementia praecox and involutional melancholia. The trend for dementia praecox has been an increasing age until about 1926 and a decreasing age since then. No apparent reason for this change is known. The decreasing



median age for melancholia is probably due to better differential diagnosis between this condition and manic-depressive, depressed. The trend of the alcoholic psychoses has been irregular, reflecting the influence of national prohibition and changes in low and social attitudes. The average age at death has shown a steady increase from 54 in 1913 to 65.4 in 1941. This reflects better care and medical therapy, and a trend to prevent early discharge of those whose condition was improved but not to the extent of complete "social" recovery. The av. years of hospital residence at the time of death, 6 yrs., has not changed significantly over the period studied. In general, though, there is a trend toward increased years of residency for all the psychoses because of the combined effect of age of admission and increased age at death. A part of this increase is due to the increasing life of dementia praecox patients who have the slowest rate of recovery in mental hospitals. Factors that influence these trends to the greatest extent are: (1) increased age of general population; (2) better medical and custodial care; (3) decreased immigration; and (4) pressure of economic and urbanization effects.—R. F. Becker.

2629. Nelson, L., and H. Clappitt. Population trends in Minnesota, 1940. *Bull. Minnesota Agric. Expt. Sta.* 387. 1-39. 28 fig. 1945.—This represents, in part, a revision of Bulletin 327, but has been mostly rewritten to incorporate data from the 1940 census. In 1940 it appeared that the State was approaching a rather stationary population. As in the U. S. in general, the population has gradually shifted from predominantly rural to predominantly urban. The rate of birth is now near the national average. The trend toward fewer young and more old people has great significance to the social institutions of the State, particularly the schools and welfare organizations. Migration from farms to towns and cities is seriously upsetting the ratios of the sexes, creating a deficit of males in the cities and a vast surplus in the country.—*Courtesy Expt. Sta. Rec.*

2630. Oyler, Merton D. (*U. Kentucky, Lexington.*) Fertility rates and migration of Kentucky population, 1920 to 1940, as related to communication, income, and education. *Kentucky Agric. Expt. Sta. Bull.* 469. 1-43. 1944.—The method of analysis involved the construction of index numbers for the 120 counties in Kentucky to measure these items: Population fertility; migration during the 1930's of youths aged 10 to 19; average gross income per farm; communication of farm families; and high school attendance ratio. Highly significant zero order correlations for the 73 all rural counties included:  $r_{13} = -0.82$ ,  $r_{14} = -0.79$ ,  $r_{24} = -0.88$ . Increase in high school attendance in Kentucky counties is the cause of a lower population fertility rate, even when variations due to change in income and communication are removed. Low income is the strongest single factor among those here considered in stimulation of migration. High education is next in influence. Public highway construction is shown to result in increased communication somewhat independently of average farm income, thus tending to lower the birth rate and to stimulate out-migration.—M. D. Oyler.

2631. Simons, Edwin J. (*Med. Unit of Social Welfare, St. Paul, Minn.*) Facts and inferences of Minnesota Sanatorium admittances. *Jour.-Lancet* 66(4): 105-108. 1946.—Only 15% of first admittances to tuberculosis sanatoriums have been minimal cases. During 1938 to 1945, the % of minimal cases has not increased but there was a slight increase of moderately advanced cases (30 to 36%). Intensification of diagnostic and case finding methods are indicated by 1) the low % of minimal cases, 2) the decreasing number of first admittance of reinfection cases especially in rural districts and 3) the high percentage (17) of tuberculosis cases first reported by death certificate. Mass radiography in 2 surveys disclosed many minimal cases and it is the solution for diagnosis and case finding in Minnesota.—Robert Schrek.

2632. Tutunji, Djamil. Population control and world health. *Human Fertility* 11(3): 78-79. 1946.—A plea for birth control.

2633. Watkins, John H. (*Yale U. Med. Sch., New Haven, Conn.*) Connecticut's rank among the states with respect to various health factors. *Jour. Connecticut State Med. Assoc.* 10(10): 823-829. 3 fig. 1946.—The data here presented are based chiefly upon the recent article by G. Hirschfeld and C. W. Strow: Comparative Health Factors Among the States. *Amer. Sociolog. Rev.* 11(1): 42-

52. 1946.—Watkins has supplemented the study of Conn. by material from 36 statistical reports (refs. cited). Eight categories are considered and Conn.'s rank among the states reckoned. These are summarized as follows: 1. Population (31st) because it is one of the smaller states; 2. Culture (8th); 3. Economic resources (2nd); 4. Sanitation (4th); 5. Medical facilities (6th); 6. Health insurance (5th)—as represented by Blue Cross hospitalization. 7. Physical status (4th) and 8. Mortality (9th). Connecticut's position is indicated by an arrow on each of 36 small graphs representing phases of the 8 categories studied in all the 48 states compared. The results show that Conn. is one of the most healthful states in which to live.

2634. Anonymous. Postwar increase in suicide. *Statist. Bull. Metropolitan Life Insurance Co.* 27(4): 6-7. 1946.—The downward trend in the suicide rate for the company's industrial department ended over a year ago; the recent trend has been upward. The rise has been larger for men than women.—P. K. Whelpton.

2635. Anonymous. Fatal accident rate highest in the West. *Statist. Bull. Metropolitan Life Insurance Co.* 27(4): 7-10. 1946.—The rate for deaths due to accidents is highest in the Mountain and Pacific States, and lowest in the New England and Middle Atlantic States, due primarily to variations in the rate for deaths from motor vehicle accidents.—P. K. Whelpton.

2636. Anonymous. Longevity of the American people in 1944. *Statist. Bull. Metropolitan Life Insurance Co.* 27(5): 1-3. 1946.—Age specific mortality rates for white and colored persons by sex in 1944 and the expectation of life at various ages according to these rates, are compared with similar data for prior yrs.—P. K. Whelpton.

2637. Anonymous. Inter-marriage among national groups increasing. *Statist. Bull. Metropolitan Life Insurance Co.* 27(5): 4-5. 1946.—The discussion is based on 2 tables which show for New York State (exclusive of New York City) in 1928 and 1941 the proportion of white brides and grooms (a) foreign-born, grouped by country of birth, and (b) of foreign or mixed parentage, grouped by country of birth of parents, who marry grooms or brides of (c) the same national stock and (d) other national stock.—P. K. Whelpton.

2638. Anonymous. Mortality in industrial population at record low. *Statist. Bull. Metropolitan Life Insurance Co.* 27(7): 4-7. 1946.—The record low 2d quarter mortality rate for the company's industrial policy holders is due to the improvement of white ♂ rather than white ♀ mortality. The record is especially favorable for pneumonia, tuberculosis, and appendicitis.—P. K. Whelpton.

2639. Anonymous. Sharp rise in motor vehicle fatalities. *Statist. Bull. Metropolitan Life Insurance Co.* 27(7): 7-8. 1946.—The rate for these fatalities in the first half of 1946 is nearly 30% above the 1945 figure but well below the 1941 figure for the company's industrial policyholders.—P. K. Whelpton.

2640. Anonymous. Wartime changes in the ages of parents. *Statist. Bull. Metropolitan Life Insurance Co.* 27(7): 9-10. 1946.—The wartime spurt in the birth rate was due, not so much to an increase in the number of large families, as to the creation of new families, and an increase in the number of families of moderate size. During the early war period there was a definite increase in the rates at which children were born to young fathers. In 1944 fertility rates were lower for fathers under 35, but continued to rise for those 35 or older. Similar changes occurred among women. Considering only the years 1937-44, rates for first births to women aged 10-54 increased to 1942 and then declined, and rates for 2d births rose to 1943. Rates for 3d, 4th and 5th births were highest in 1944 and for 6th births in 1937 and 1938. Rates for 8th and higher order births declined 20% from 1937 to 1942, but then rose slightly.—P. K. Whelpton.

## GROWTH

2641. Pedrey, Charles P. (*U. S. Naval Hosp., Philadelphia, Pa.*) A study of voice change in boys between the ages of eleven and sixteen. *Speech Monogr.* 12: 30-36. 1945.—1,014 ♂ between 11 and 16 yrs. were checked relative to voice change together with information on weight, height and pubic development. Chronological age is the most consistent factor in determining onset of change of voice. The growth shift in the direction of adult voice occurs on the

average of age 14 although 1.29% of boys have adult voices at age 11. 23% of prepubescent boys still had childish voices while 75.5% were beginning to change. At the pubescent level, 89% of the boys were in process of voice change. Age and pubic development were equally reliable as indices of the stage of voice development, the correlations being 0.65 and 0.68, respectively. Voice break may occur at any age. Approx.  $\frac{1}{2}$  of the boys studied recalled having the voice break. About  $\frac{1}{2}$  of these, in turn, reported some feeling of embarrassment concerning the break.—*M. F. Palmer.*

#### BEHAVIOR

2642. Ackelsberg, Sylvia B. (*Columbia U., N. Y. C.*) Vocabulary and mental deterioration in senile dementia. *Jour. Abnormal and Social Psychol.* 39(4): 393-406. 1944.—The general purpose of this investigation was to study the relationship of various kinds of vocabulary functioning to mental deterioration in the senile demented, and to determine whether the vocabulary tests devised by Capps offered a valid and reliable index of deterioration. Five types of vocabulary tests were used: (1) a synonym test, (2) an antonym test, (3) a categorization test involving the classification of several "species" words with a common "genus" word (4) a list of 12 homographs with a minimum of 5 different meanings, and in which the subject was to state as many as he could within 2 minutes, and (5) a free-association naming test where the subject named as many words as possible in 3 min. The subjects were 50 patients, ♂ and ♀ of the type senile dementia, simplex, ranging in age from 60 to 85. Hospital records were so incomplete that only a fair amt. of control was maintained in the matching of mental capacity, education and background. The subjects were divided on the basis of hospital reports into 3 groups: least, mild, and most deteriorated. The more deteriorated the subject the lower was his score on all 5 tests. The mildly deteriorated were reliably inferior to the least deteriorated only on the synonym and antonym tests, but the most deteriorated group was reliably inferior to the other 2 groups on all 5 tests. Previous findings seem to indicate that vocabulary tests remain relatively constant and unchanged in deterioration as opposed to non-vocabulary tests. Indeed, that premise is the basis for the currently used "Efficiency Index" of Babcock and of the Hunt-Minnesota test for Organic Brain Damage. The present findings run contrary to this premise, and actually imply that tests involving vocabulary functioning serve as a good means of discriminating among deteriorated patients. The synonym and antonym tests are offered as the most reliable measures in this respect.—*R. F. Becker.*

2643. Birren, J. E. (*Northwestern U., Chicago.*) Psychological examinations of children who later become psychotic. *Jour. Abnormal and Social Psychol.* 39(1): 84-96. 1944.—The records of a psychotic group of 38 persons, who had come to the attention of the Chicago Child Study Bureau as school children and who were later committed to state mental hospitals, were compared with the records of 53 control subjects from the general population examined by the Bureau. The pre-psychotic sampling was broken into 3 subgroups: (1) schizophrenic; (2) constitutional (brain pathology, paresis, etc.); and (3) miscellaneous psychoneurotic. The pre-psychotic cases as a group did not differ in intelligence from the control group. But a breakdown showed the constitutional group having the lowest IQ's, the schizophrenics the highest. Nor was there any difference in the mean grade level at which the children of either group were referred to the Bureau for study. The common reason for referral of all the children was backwardness in school. The chief difference seemed to be in the way the children reacted to the testing situation. While most of the cases in both the control and pre-psychotic groups exhibited good rapport, the later schizophrenics were chiefly characterized by apathy toward the test situation and the later constitutional group by excitability. The records of all of the pre-psychotic group were then grouped into three categories on the basis of their test reaction as children, i.e., excitable, good rapport and apathetic. It was found that the apathetic group had a higher IQ (84.7); was committed to hospitalization at age 17.7 yrs.; was never committed for reasons of social aggression. The excitable group had the lowest IQ (61.3); was committed at age 21.8 yrs.; and, in 7 cases out of 8, were committed for unusual social aggression. In the cases of

good rapport the IQ was 81.7, commitment age, 19, and one case was listed under social aggression. The excitable group made the best hospital adjustment and had a good prognosis rating on the Elgin Prognosis Scale. The apathetic group did not adjust readily and had the lowest prognosis rating. Both the apathetic and good rapport groups were committed on the basis of seclusiveness and delusions. On the whole, it is difficult, with the usual clinical methods, to distinguish the general group of children destined to be institutionalized for mental disease from the general group of children referred to a child study bureau for school problems. But the organic brain defective and the schizophrenic can be spotted on the basis of excitability and apathy in the test situation. These personality characteristics seem to be stable and evidence continuous development from childhood.—*R. F. Becker.*

2644. Burgess, E. W. (*U. Chicago*), and P. Wallin. (*Stanford U., Calif.*) Homogamy in personality characteristics. *Jour. Abnormal and Social Psychol.* 39(4): 475-481. 1944.—The findings of almost all studies of assortative mating confirm the hypothesis for "like to mate with like" rather than the tendency for "opposites to attract each other". Data in this study were secured from 1000 engaged couples in the Chicago area. All were whites,  $\frac{3}{8}$  with native born parents. The age range was between 20 and 30. Three fourths of the men and  $\frac{2}{3}$  of their fiancées were at college level; the rest nearly all high school graduates. About  $\frac{1}{2}$  were Protestants; and a large majority identified themselves with the middle or upper middle class. Two series of personality data were obtained: (1) responses to 42 items in the Thurstone Neurotic Inventory, and (2) Self ratings of 316 of the group on 23 selected personality traits on which the subjects rated themselves along a 5-point scale. Many of the latter traits recurred in spontaneous descriptions of themselves at personal interviews. Data were also obtained on height, wt., health status, complexion, and physical appearance. 14 of the Inventory items were statistically significant in indicating homogamy in regard to neurotic tendencies; a number of other items approached the significance level; and all of the 42 items were in the direction of homogamy. The same was true in the case of the personality ratings: 9 traits were statistically significant; the rest were in the direction of homogamy. Similar trends held for the physical factors studied except in the case of complexion. These same subjects gave evidence of a lesser degree of homogamy in regard to personality characteristics than they did in religious affiliation and behavior, cultural background, courtship behavior, conceptions of marriage, and social participation. "Cultural likeness" appears more important in marital selection than "temperamental or personality similarity".—*R. F. Becker.*

2645. Cleveland, S. E., and D. W. Dysinger. (*U. Nebraska, Lincoln.*) Mental deterioration in senile psychosis. *Jour. Abnormal and Social Psychol.* 39(3): 368-372. 1944.—Twelve institutionalized senile patients with a mean age of 75.1 yrs. were used as subjects in this study. Their performance on the Wechsler-Bellevue Adult and Adolescent Intelligence Scale and on the Goldstein and Scheerer Objective Sorting Test was compared with the performance of 5 schizophrenics. The majority of the senile patients were unable to sort objects on the basis of conceptual or abstract principles, but were limited to concrete bases of use and reality in a non-immediate situation in their classification of objects. Their object sortings were qualitatively similar to those of the schizophrenics. This behavior bore little or no relation to the patient's level of ability as measured by the verbal portion of the Wechsler-Bellevue Scale. As a matter of fact, both senile and schizophrenic groups could classify on an abstract verbal level in the similarities part of the Wechsler-Bellevue Scale when they were unable to sort objects on an abstract or conceptual basis. It seems that patients may use what appears to be an abstract verbal concept with a much more restricted meaning. There seemed to be a hierarchy of ability among senile patients in the Object Sorting situation, dependent upon the number of possible bases of sorting in each group of objects. When the possibilities were sufficiently limited they were capable of identifying relationships, but solely of a concrete type. Intelligence level is not a factor which facilitates sorting. 8 subjects with I.Q.'s within or above average range were unable to sort at an abstract level; a few others with low I.Q.'s could. Most of the senile subjects experienced great difficulty on the Performance Scale of



the Wechsler-Bellevue as well despite high scores on the Verbal Scale. The response of the schizophrenic subjects did not reflect this inability to handle performance materials, and their performance scores and verbal scores were quite comparable. There seems to be some indication of the existence of a qualitative difference in the loss of function in senile deterioration compared to that in schizophrenia.—R. F. Becker.

2646. Davis, C. Nelson. Why neurotics? Veteran problem. Normal adjustments of veterans. *Pennsylvania MEd. Jour.* 49(11): 1208-1213. 1946.—Psychoneurosis and psychosomatic are new terms for an age-old condition. Examples are cited from Revolutionary and Civil War days (refs. given) and from the recent global wars. Davis states that one of the best descriptions in current literature of the individual's reaction to war is in Catherine Drinker Bowen's "*Yankee from Olympus*" (Little, Brown & Co.). The subject, the late Justice Oliver Wendell Holmes, was an officer in the Union Army who suffered from an anxiety neurosis or combat fatigue. Few Americans like military life, although they accept it as a necessary evil. The need of constant adjustment wears down nervous energy. When the man returns from service he faces many changes. Some find broken marriages, financial losses, loss of work, etc. Compensation of the psychoneurotic may be very detrimental. Instead of financial aid, every effort should be made to secure a suitable job for him and to direct his mental and physical energies into new, stimulating conditions.

2647. Hebb, D. O. (*Yerkes Lab. Primate Biol., Orange Park, Fla.*) Emotion in man and animal: An analysis of the intuitive processes of recognition. *Psychol. Rev.* 53(2): 88-106. 1946.—Recognition of emotion in man and animal is fundamentally the same process, namely the recognition of deviation of overt behavior from an habitual base line. Laboratory studies which show unreliability of emotional identification yield such results because of the short duration of observation.—S. S. Marsolf.

2648. Hildreth, Gertrude. (*Columbia U.*) A school survey of eye-hand dominance. *Jour. Applied Psychol.* 29(1): 83-88. 1945.—The belief is widespread that mixed eye-hand dominance, i.e., the tendency for eye and hand preference to be opposite sided, is a cause of reading disability, nervousness and behavior problems in children. A number of published studies report conflicting results. Further evidence bearing on this question was obtained through a survey of an elementary school population of 101 boys and 90 girls from kindergarten to Grade VI. Age ranged from 6 to 11 yrs. The population ranged above average in general ability and any reading disability which existed in it was not due to intellectual incapacity. The tests for eye dominance were: Sighting a dot through a half-inch hole with each eye; sighting with the Parson manoptoscope; sighting through a 1/4-inch aperture at an Easter-egg peepshow to discover eye used in fixating on pictures. The tests of handedness were simple: picking up scissors and cutting; writing name; and picking up and tossing a ball. Stanford Reading Achievement scores were available for all subjects. The % of mixed dominance at all age levels was 30.6%. There was no clear cut developmental tendency from one age group to the next. Most studies report a decrease in left-handedness with age, and there is some slight evidence of support of this in the present data. But there was no similar decrease with age in left-eyedness; rather, a considerable increase in the 11-yr. group. Right-eyed children showed more consistency in all the eye tests than did left-eyed children. There were a substantial number of right-eyed children writing with the left hand. 22 subjects were having reading disability. About 45% of these were of the mixed dominant type. But these subjects represented < 1/2 of all the mixed dominant types in the population studied. It is concluded, that mixed dominance is not a prevailing condition in reading disability, and far less a dominant causal factor in the majority of disability cases.—R. F. Becker.

2649. Hunt, Howard F. (*U. Minnesota, Minneapolis.*) A note on the problem of brain damage in rehabilitation and personnel work. *Jour. Applied Psychol.* 29(4): 282-288. 1945.—Certain types of brain injuries are apt to be unaccompanied by appreciable symptoms of sensory and motor loss. Rather there will be subtle changes of intellectual deterioration, and alterations in the emotional life and personality of the individual. It is pointed out that the standard tech-

niques used by physicians in the diagnosis of brain injury often fail to yield the crucial information needed for the vocational management of such individuals. There is a critical review of the best clinical tests available for the detection of these subtle changes, and a discussion of the problem of vocational prognosis for the brain-injured.—R. F. Becker.

2650. Kallmann, Franz J., and Mary M. Anastasio. (*New York State Psychiat. Inst. and Hosp., N. Y. C.*) Twin studies on the psychopathology of suicide. *Jour. Heredity* 37(6): 171-180. 1946.—The relative importance of physiological, social and biological factors interacting in the successful execution of intentional suicide is discussed. The authors warn against the common tendency to over-emphasize individual motivational factors in the usually complex scheme of causation of self-destructive acts. In view of the complexity of the problems involved in the human equation of suicide, they seek clarification through an analysis of the "experimental" conditions provided by the twin study method. Their analysis is based on a total of 17 twin suicide cases, 6 of which were found in the literature. The latter group includes 4 suicides which may have occurred in pairs, but their authenticity is questionable. Concordance of twin partners as to suicide has not been recorded during the past 50 yrs. Of the 11 discordant twin suicide cases collected by the authors, 3 occurred in monozygotic and 8 in dizygotic twins. In 3 of the dizygotic pairs, personal achievements and general life conditions were apparently in favor of the suicidal twin partners. There was no evidence in any pair, however, that the suicidal twin had a clearer motive or better opportunity to commit suicide than the survivor. Even in the 3 monozygotic pairs, both members did not commit suicide although their histories showed great similarity in regard to behavioral patterns, type of personality, cultural setting, social frustration and depressive features of a psychosis. The authors suggest that suicide be defined as the psychopathological result of "an abnormal twilight state of self-destructive ecstasy in response to the inability to adjust to some particular intertanglement of competitive life circumstances".—F. J. Kallmann.

2651. Martin, A. H. (*U. Sydney, Sydney, Australia.*) A worry inventory. *Jour. Applied Psychol.* 29(1): 68-74. 1945.—This inventory is a fresh attempt at the measurement of maladjusted trends in personality. Most tests of this type are cast in the form of questions, and are often difficult for a candidate to answer. In this list, brief descriptions of worry symptoms are set out in very simple, unambiguous terms. Subjects do 2 things: (1) underline all items which cause them to worry; (2) ring those items which are present worries. The 63-item list was given to 100 university students of both sexes ranging in age from 17 to 47 yrs. There were no reliable sex or age differences shown in the returns. The test items grouped into six main categories. Analysis showed that people worry about the following things in descending order of frequency of underlining items on the list: sex; inferiority; physical symptoms; schizoid trends; religious difficulties; fear and anger, or cyclothymic trends. The test correlated highly with the commonly used "Neurotic Inventory" of Thurstone (+.81), and negatively with tests of extroversion (-.56). Points in favor of this test over the current self-administering check-lists on emotional stability are: (1) simple administration, (2) simple scoring, (3) items easy to comprehend. Of course, one must still rely to a great extent on the basic honesty of the subjects taking the test.—R. F. Becker.

2652. Muench, G. A. (*Ohio State U., Columbus.*) A follow-up of mental defectives after eighteen years. *Jour. Abnormal and Social Psychol.* 39(4): 407-418. 1944.—In 1925, Mary E. Adams studied a group of 40 mentally defective boys between the ages of 13 and 14, of native white parentage, educationally retarded, without physical handicaps, and not seriously delinquent. The present author found 18 of these still living and followed up their status 18 yrs. later. 8 of the group had previous records on mental tests, and, when retested 18 yrs. later, showed a mean increase on the 1916 Binet of 3 yrs. and 6 months in M.A., and 15.4 points in I.Q. The mean increase on the 1937 Revision was 4 yrs., 1 month in M.A., and 27.2 points in I.Q. This is a significant difference since the mean C.A. of the group was 13 yrs., 10 months at original testing. There was also an increase in mean I.Q. of 10.8 points on the Army Alpha; and 24 points on the Porteus Maze. There was no increase on the



Ohio Literacy and other reading tests, indicating that these I.Q. increments were not due to increased reading ability. 7 out of 8 of these defectives were married and 4 of the married men had a total of 12 children. Every one of them had a socially acceptable job, earning an average weekly salary of \$25 to \$45 over a period of the last 5 yrs. All carried some form of life insurance. Six owned automobiles, and 6 owned much of their own furniture. None had a court record for any serious crime in society. Considering how static I.Q.'s tend to remain among institutionalized defectives, the opportunity of the stimulation of community life seems to have had a definitely positive effect on both the social and mental development of these individuals. It is suggested that perhaps the best possible method of dealing with mental defectives is not to institutionalize them, but to give them special educational training, while at the same time affording them the opportunity to actually live in the society to which they need to adjust.—R. F. Becker.

2652A. Pattie, F. A., and Billie B. Knight. (*Rice Inst., Houston, Texas.*) Why does the speech of stutters improve in chorus reading? *Jour. Abnormal and Social Psychol.* 39(3): 362-367. 1944.—In order to test the theory that stutters' speech improves when they read in unison with another person because such a situation relieves the subject of the responsibility of communication or reduces the prominence of his performance, expts. were instigated in which the stutterer read before a small audience while the unison reading of another person was conveyed by means of telephone. Under such conditions the subject is responsible for communication with the audience, and his performance is not merged in any "background" but stands out as strongly as if he were reading alone. The expt. showed that the subjects (5 adults, and 7 between the ages of 12 and 17 yrs.) read as well in this situation as they did when the other reader was with them before the audience. Even when the subject and reader read different material in the telephone expt., there was as much improvement as when the other reader was present. It is concluded that "the burden of communication" and "the salience of the stutters' performance" are negligible factors in any improvement produced in situations of chorus reading.—R. F. Becker.

2653. Smith, G. M. (*Coll. City, N. Y.*) The effect of prolonged mild anoxia on speech intelligibility. *Jour. Applied Psychol.* 30(3): 255-264. 1946.—Using the method and materials described in earlier work with C. P. Seitz (same *Jour.* 30(2): 1946), 12 subjects were tested for their ability to perceive speech sounds at 4 intervals during an 8-hr. exposure to mild anoxia in a nitrogen dilution chamber at simulated altitude of 10,000 ft. These subjects listened to recorded speech sounds played at a low level of intensity, and checked off the stimulus words on 4 separate tests containing check rows for 11 vowels and 24 consonants. The testing periods in the chamber came at  $\frac{3}{4}$  hr.,  $2\frac{1}{4}$  hrs.,  $4\frac{3}{4}$  hrs., and  $6\frac{3}{4}$  hrs., respectively. A high protein standardized lunch intervened between the 2d and 3d testing periods, beginning at  $3\frac{3}{4}$  hrs. and lasting  $\frac{1}{2}$  hr. A control run at 1,810 ft. for 8 hrs. was given under exactly the same conditions which included the wearing of oxygen masks, ear phones, etc., so that the subjects were not aware of altitude differences. The decrement in speech intelligibility was unreliable at the  $\frac{3}{4}$  hr. period; nearly reliable at  $2\frac{1}{4}$  hrs. and  $4\frac{3}{4}$  hrs.; and unreliable at  $6\frac{3}{4}$  hrs. at which time a marked end spurt in superior performance occurred. This ability to overcome the mild deterioration exhibited in the middle of the run was probably due in part to earlier wandering of attention and boredom. There were subjective reports of greater sleepiness during altitude than during control runs. But there was also clear evidence of a reliable and progressive enlargement of the angioscotomy during the prolonged exposure period. While it seems improbable that significant losses in speech intelligibility will occur on bomber missions at this order of altitude, the subjective factors mentioned may cause errors in speech perception.—R. F. Becker.

2654. Smith, G. M., and C. P. Seitz. (*Coll. City of N. Y.*) Speech intelligibility under various degrees of anoxia. *Jour. Applied Psychol.* 30(2): 182-191. 1946.—Twelve male college students, 18-21 yrs., free from systemic defects at medical examination, served as subjects. The method of observing effects of  $O_2$  deprivation involved the subjects' ability to hear and to indicate on a check-list words

in common speech at sea level, and at simulated altitudes of 13,600, 16,900 and 20,100 ft. in a nitrogen dilution chamber of 450 cu. ft. capacity. Temp. was constant at  $74^\circ F$  with 60% rel. humidity. Air samples by Haldane-Henderson-Baily gas analysis did not deviate from the desired altitudes more than 600 ft.  $CO_2$  content averaged 0.52%. The altitudes corresponded to  $O_2$  percentages of 12.5, 10.3, and 8.85, respectively. Uniform difficulty of test materials was assured in the control and exptl. periods by use of 8 lists of recorded stimulus words. Test batteries for any one of the 4 conditions were made up of the same word lists but presented in varying order. They were derived from standard word lists by the Bell Telephone Laboratories. Intelligibility for vowel sounds was tested by monosyllables having the same initial and final consonants; e.g., "suit", "sit", "set", etc. Consonant intelligibility involved a consonant vowel sound but a variation in initial and final consonant; e.g., "nor", "bore", "yore". There were 11 vowel items and 24 consonant items in each list. The lists were recorded on high fidelity equipment at N.B.C. Studios, New York City and put in semi-permanent form by R.C.A. of Camden, N. J. The recordings were played back in the chamber through a Fairchild pick-up coupled with a Presto amplifier and Western Electric earphones. Oxygen masks were worn by experimenter and subjects at all times in the chamber, so that the subjects were not aware of sea level runs. Following recorded instructions, Test 1 was given at sea level at high sound intensity (30 lb. with vowel articulation 98% and consonant articulation 94%). Test 2 came at exptl. altitude and same intensity after a 15 min. adjustment period. Tests 3-10 followed at same altitude but low intensity (24 lb. with vowel articulation 92% and consonant articulation 50%). Test 11 was given at altitude with a return to high sound intensity, and test 12 at sea level with high intensity. The average time of simulated ascent was 14 min. with an over-all time in chamber of 75 min. The mean articulation values for vowels, consonants and standard syllables dropped systematically as altitude increased. Standard syllable articulation values were calculated by the Fletcher-Steinberg formula  $S = (1 - VC^2)^{0.9}$ . At sea level this value was 24.6%; at 13,600 ft., 21.6%; at 16,900 ft., 8.0%; and at 20,100 ft., 3.7%. Values for vowels and consonants showed a similar trend with the vowel values very much better than those for consonants under all conditions. The character of this drop is very definitely a function of initial difficulty at sea level, for when mean syllable articulation was 55.5% at sea level there was only an 8% drop at 18,500 ft. (previous study), whereas with a 24.6% sea level value in the present instance, decrements of 16.6% at 16,900 ft and 20.9% at 20,100 ft. occurred. That the ability to perceive speech sounds is affected by increased anoxia was demonstrated by the fact that 67% of the subjects showed some loss of efficiency at 13,600 ft.; 92% were affected at 16,900 ft., and 100% at 20,100 ft. The large decrement in performance at 13,600 ft. suggests the importance of oxygen equipment on long flights even at low altitude if effective communications are to be maintained.—R. F. Becker.

2655. Werner, Heinz. (*Brooklyn Coll., N. Y.*) Abnormal and subnormal rigidity. *Jour. Abnormal and Social Psychol.* 41(1): 15-24. 1946.—The term rigidity as used here apparently connotes a tendency to persevere or to persistently repeat an activity once begun. The author demonstrates a difference in respect to this behavioral characteristic in 2 groups of mentally retarded children closely matched according to MA and IQ. The mean IQ of 18 brain-injured children in the study was 68.2; their mean MA, 9-0. The 18 non-brain-injured, or feeble-minded children of the second group had a mean IQ of 69 and a mean MA of 9-1. Four expts. were designed which would encourage repetition of previously learned responses. Material was presented visually or auditorily, and the children reproduced these presentations at once by drawing, speaking, or pressing a key to reproduce certain rhythmic tone patterns. A preliminary series of presentations consisted either of rhythmic tone patterns to be duplicated, pictures of objects to be named, dot configurations to be drawn, or word lists to be repeated. Each of these periods was followed by a main testing sequence requiring the reproduction of similarly presented material. The brain-injured children, in all expts., produced significantly more perseverations than did the feeble-minded group. This difference in tendency toward rigidity was quantitative

and qualitative: brain-injured children often showed a "delayed" or a "repetitive" type of perseverated response. They tended to repeat patterns which were presented 2 or more trials back, or which appeared more than once in a series. Perseveration among the feeble-minded was essentially simple, consisting of single repetitions of immediately preceding patterns. The feeble-minded response can be considered a subnormal form of rigidity, best descr. in terms of dedifferentiation. Whole situations, not sharply set apart from one another, tend to fuse easily, resulting in stereotyped behavior. The abnormal type of rigidity encountered in the brain-injured seems best descr. in terms of disintegration. Whole situations are dissected into parts, and singular elements become self-contained and isolated to such an extent that they may be repeated over and over again, or appear suddenly in the fore, despite the incongruity of such behavior.—R. F. Becker.

2656. Werner, H., and Doris Carrison. (Wayne County Training Sch., Northville, Mich.) Animistic thinking in brain-injured, mentally retarded children. *Jour. Abnormal and Social Psychol.* 39(1): 43-62. 1944.—Eighteen pairs of mentally retarded children were tested to determine their attitude toward objects. Each pair was composed of a brain-injured child and a non-brain-injured child (familial history) matched for mental age and I.Q. In the first expt., the children were asked to tell whether certain objects or events were "living" or "dead." Brain-injured children considered more inanimate objects as living than did the children of the familial type. The same was true for natural events (winds, clouds, moon, etc.). If it is true that children's thinking follows a genetic sequence of stages from animistic to realistic attitudes, then brain-injured children place low on this developmental scale. Brain-injured children distinguished between living and dead more on the basis of use and human characteristics; the familial mental defectives discriminated more on the basis of spontaneous movement. There was greater variability in the answers given by brain-injured children so that the number of unique answers was higher in this group than in the familial group. In the 2d test, questions were asked concerning the capability of inanimate objects and natural events to "feel," "know," "be mean," etc. The results corroborated the first experiment. The brain-injured group gave a significantly greater number of responses attributing conscious activity to these objects. The authors have shown in other work that the brain-injured child is not lacking in an understanding of verbal concepts. These differences must be explained by other factors. The brain-injured child pays more attention to distractible stimuli than other children; he perseverates more; and he is lacking in willful, self-directed behavior. All of these things seem to make him less aware of the difference between spontaneous, personal activity, and external occurrences in the world of things.—R. F. Becker.

#### ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

2658. Baird, Edward G. Jr. (Yale U., New Haven Conn.) The alcohol problem and the law. III. The beginnings of the alcoholic-beverage control laws in America. *Quart. Jour. Stud. Alcohol* 7(1): 110-162. 1946.—Early statutes aiming at control of drunkenness and sale of alcoholic beverages in colonial New England, together with case reports from colonial courts, are reviewed. Neither the purpose nor the application of the statutes was essentially different from that of England in the same period.—E. G. Baird, Jr.

2660. Goldberg, L. Quantitative studies on alcohol tolerance in man. The influence of ethyl alcohol on sensory, motor and psychological functions referred to blood alcohol in normal and habituated individuals. *Acta Physiol. Scand.* 5: 1-128. 1943.—Expts. were made with 49 ♂ subjects, of whom 24 were moderate and 14 heavy drinkers, and 11 were abstainers. Alcohol was administered to all by mouth in 40% soln. in varying doses. The curves of alcohol conc. in the blood were plotted and tests designed to measure sensory, motor and psychological functions were given to each subject before and during the alcohol expt. The fusion frequency of the eye to intermittent light and the sensitivity of the cornea to air stimuli measured the sensory functions, 2 versions of the Romberg test and a finger-to-finger test measured the motor functions; for the psychological functions, the subtraction test and the Bourdon tests were used. With fasting subjects, the

sensory functions were influenced at the lowest and the psychological ones at the highest concns. of alcohol in the blood; departure from normal values was greatest in the motor functions. The differences between the appearance and the disappearance thresholds (the alcohol conc. in the blood at which a symptom appears or disappears) varied according to the type of function tested: for the sensory functions the thresholds coincided; for the motor functions the disappearance threshold was higher than the appearance threshold; for the psychological functions the disappearance tended to occur later than the blood alcohol maximum; the maximum disturbance of motor functions coincided with the blood alcohol maximum; the max. psychological disturbance occurred earlier than the blood alcohol max. When the same expts. were repeated with the intake of food, the subsequent concs. of alcohol in the blood, as well as the degree of effect on all functions tested, were decreased. But the disappearance thresholds were proved to be of approx. the same magnitude, whether alcohol was taken on an empty stomach or with a meal, indicating that the lowering effect that food has on alcohol intoxication is due to its depression of the blood alcohol curve. The disappearance thresholds for all functions were 0.33% for abstainers, 0.61% for moderate drinkers and 0.63% for heavy drinkers. The blood alcohol curves differed somewhat among the 3 groups, suggesting a more rapid absorption by habituated subjects and a slight difference in the rate of disappearance of alcohol from the blood. None of these differences, however, could explain the differences in test results. It is concluded "that there really exists a habituation to ethyl alcohol pharmacologically, implying a changed reaction to the prolonged use of alcohol, habituated individuals being less, and not habituated individuals being more influenced by the same dose." Thus, among the factors causing varying resistance to alcohol, one—the degree of habituation—was clearly demonstrated; another factor—"the ability of the organism to compensate psychically the influence of alcohol"—is strongly suggested. Increased tolerance is due "to an increase in the blood alcohol threshold for the symptoms, localized to the central nervous system and parallel to the degree of habituation."—Courtesy Quart. Jour. Stud. Alcohol.

2661. Jellinek, E. M. (Yale U., New Haven, Conn.) Phases in the drinking history of alcoholics. Analysis of a survey conducted by the official organ of Alcoholics Anonymous. *Quart. Jour. Stud. Alcohol* 7(1): 1-88. 1946.—A 36-item questionnaire filled out by 98 ♂ members of Alcoholics Anonymous was analyzed statistically. Alcoholism, as experienced by these subjects, could be divided into 3 distinct phases: (1) A basic phase in which the main characteristic is "loss of control in the drinking situation," with subsequent development of a rationalization system, extravagant behavior and morning drinking. (2) An intermediate or compulsive-obsessive phase starting with an acute stage of frequent going on "benders" and developing into a chronic stage characterized by tremors, indefinable fears, exaggerated forms of rationalization of the entire conduct, and various symptoms of anxiety. (3) A terminal phase in which the rationalization system slowly weakens until it breaks down entirely. In the latter stage a large proportion of the alcoholics develop "religious need" and come to recognize their defeat, but continue drinking until they reach a point recognized by the individual as having "hit bottom." According to the age at onset of alcoholism, the duration of the entire process varies between 7 and 19 yrs. It is suggested that further studies of drinking histories may reveal a group of behaviors prognostic of alcoholism in the offing, knowledge of which may aid in prevention. A proposed revised questionnaire form, designed to yield more pertinent information if administered to large groups, is appended.—E. M. Jellinek.

2662. Lehermitte, J. L'influence des restrictions alimentaires sur les internés et les sujets des hospices des vieillards. Le rôle de l'alcoolisme dans l'étiologie des psychopathies. [Effect of food restrictions on the interneers and inmates of homes for the aged. The role of alcoholism in the etiology of psychopathies.] *Bull. Acad. Méd. [Paris]* 128: 692-695. 1944.—In the St. Anthony Hospital in Paris, which admits an average of 500 patients per year, the number of alcoholic admissions during the 3 yrs. prior to the war varied between 55 and 65% of total admissions for men, and between 21 and 22% for women. In 1942 the figures were

21% for men and 7.8% for women. These percentages indicate the importance of alcoholism in the etiology of psychopathies.—*Courtesy Quart. Jour. Stud. Alcohol.*

2663. McCarthy, Raymond G. (*Yale Plan Clin., New Haven, Conn.*) Group therapy in an outpatient clinic for the treatment of alcoholism. *Quart. Jour. Stud. Alcohol* 7(1): 98-109. 1946.—Use of group activity in the treatment of alcoholics in an outpatient clinic is described. Under competent leadership this technique yields good results and is effective in saving time, making possible the treatment of larger numbers of patients. Group therapy is not a substitute for individual treatment but supplements the psychiatrist's individual contacts with the patients.—R. G. McCarthy.

2664. Reininger, W. Zur Geschichte des Haschischgenusses [The history of hashish-taking.] *Ciba Zeitschr.* 7: 2766-2772. 1941.

2665. Roussel, J.-M. L'alcoolisme chronique. [Chronic alcoholism.] *Union Méd. Canada* 74: 1232-1236. 1945.—Physiological aspects of the excessive use of alcoholic beverages are described. Absorption and distribution of alcohol in the organism are explained. A safe dose of absolute alcohol must not exceed 0.5 g. per kg. of body wt. per 24 hrs. for a person of sedentary occupation, and 1 g. per kg. of body wt. for a manual worker. Habitual drinkers who drink less than these safe amounts are rare. The preclinical picture of excessive users of alcohol includes mild digestive disturbances, lowered resistance to disease, and frequent accidents. More severe symptoms appear with continued excess until finally permanent injury to organs occurs. Provided drinking is stopped before irreversible changes have occurred, the patient will recover if he abstains for several months or yrs.—*Courtesy Quart. Jour. Stud. Alcohol.*

2666. Vallery-Radot, P. J. Loeper, and C. Laroche. Diminution du nombre des cirrhoses alcooliques en ces dernières années. [Decrease in incidence of alcoholic cirrhosis in recent years.] *Bull. Acad. Méd. [Paris]* 128: 659-660. 1944.—While total admissions to the Bichat Hospital in Paris have remained approx. constant in the yrs. between 1938 and 1944, admissions for alcoholic cirrhosis have dropped from 22 and 24 in 1938 and 1939 to 5 and 3 in 1943 and 1944, respectively. The decrease is attributed to the lower consumption of wine, spirits and apéritifs.—*Courtesy Quart. Jour. Stud. Alcohol.*

2666A. Wortis, H., L. Sillman, and F. Halpern. Studies of compulsive drinkers. I. Case histories. II. Psychological test results. 90p. Hillhouse Press: New Haven, 1946.—The monograph covers 18 case histories in the Psychiatric Institute and Hospital, New York. The materials have appeared in the *Quarterly Jour. Studies on Alcohol*, 6(1945): 139-182, 300-334, (1946): 468-479. Authors' summary and conclusions (p.89f): "On the basis of the psychological test results, the alcoholic appears to be a poorly adjusted, unstable, restless individual. Unlike many poorly integrated people, he does not withdraw in the face of disturbing situations, nor does he resort to the usual adjustive or neurotic forms of behavior in his response to them. Rather he reacts to various stimuli as to a challenge. He seems to want to take chances, to expose himself to difficulties and to indulge in all manner of experiences. He refuses to recognize his inadequacies in handling various circumstances and denies any conflict within himself. All is externalized and worked

out in the environment. Yet basically it appears that the alcoholic desires a passive role. There would seem to be an element of self-punishment in his repeated exposure to all sorts of emotional hazards and activities. He seems to be constantly on trial before himself and has a compulsive need to prove himself to himself if not to the rest of the world. Why the alcoholic has not developed the usual "protective" mechanisms is not clear from the present findings. However, it is important that therapeutic attempts be directed towards this end. The alcoholic must learn to recognize his need for such compensatory forms of behavior and should be given help in accepting and developing them."—E. W. Count.

## MISCELLANEOUS

2667. Ackerknecht, Erwin H. (*Amer. Mus. Nat. Hist., N. Y. C.*) Natural diseases and rational treatment in primitive medicine. *Bull. History Med.* 19(5): 467-497. 1946.—A thorough study of primitive medicine reveals several very significant differences with our medicine. Primitive medicine is primarily magico-religious, utilizing a few rational elements; while our medicine is predominantly rational and scientific, employing a few magical elements. A majority of tribes recognize at least a few diseases or accidents as being not caused by supernatural forces, but some probably ignore the concept of natural diseases or accidents altogether. Students of primitive medicine frequently overlook the magic nature of procedures that objectively are effective and apparently rational. One of the most striking features of primitive medicine is the apparent inconsistency in the use of rational and supernatural elements. But what appears inconsistent or mixed to us, seems actually in many cases to be nothing but well integrated magic. The findings in this paper are well documented by footnotes and an extensive bibliography.—R. P. Bigelow.

2668. Downes, Jean, and Anne Baranovsky. (*Milbank Memorial Fund, N. Y. C.*) An experiment in nutrition teaching by public health nurses. *Milbank Memorial Fund Quart.* 23(3): 227-253. 2 fig. 1945.—Sixty negro families of Upper Harlem, placed under public health nursing supervision because of exposure to tuberculosis, were given special instruction for improvement of food habits. Results were measured by comparing the reported use of 5 groups of foods before and after three month teaching periods. Specific improvement was noted especially in the use of vegetables.—E. K. Kline.

2669. Howells, Thomas H. (*U. Colorado, Boulder.*) The obsolete dogmas of heredity. *Psychol. Rev.* 52(1): 23-34. 1945.—An attempt to define issues in the nature-nurture controversy by listing 14 statements about hereditary and environmental influences. These statements are judged true or false. The principal viewpoint is that only differences in traits are hereditary or environmental. "Comparative ease of learning" should be used as a criterion of hereditary influence rather than "development without learning."—S. S. Marzolf.

2670. Uribe Cualla, Guillermo. (*Ofic. Central Med. Legal de Bogota.*) Comunicación al Primer Congreso de Criminalística que se reúne en Santiago de Chile. *Rev. Med. Legal Columbia* 6(35/36): 14-24. 1944.—The organization of institutes of legal medicine for work in various criminological specialties is descr. Cooperation between such institutions is discussed.—W. C. Tobie.

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, Editor

(See also: Emotion in man and animals, 2647; Humidity response in insects of stored products, 4580; Movements of Calandra in store@wheat, 4581; Burrowing of snake, 4909; Distraction display by breeding birds, 4919; The "Tumbling" of brant, 4943; Tipping and bobbing in birds, 4948; Chick feeding by S. African Hoopoe, 4959)

2671. Hoagland, Hudson. (*Clark U., Worcester, Mass.*) Pacemakers in relation to aspects of behavior. 138p. Illus. Macmillan Co.: New York, 1935. Pr. \$3.30.—Numerous representative cases of behavior are considered in terms of the concept of the dynamic steady state and involvement of the continuous intrinsic physiologic controlling mechanisms known as pacemakers, with the view that "much of the overt behavior of organisms is determined by the interrelationships of chemical events within cells and groups of cells, quite independently

of external environmental factors." In Chapter II the growth and bioelectrical properties of plant cells are dealt with in terms of the concept of a dynamic steady state and its master reactions. In cellular kinetics, the rate of acid production in the sap controls the entrance of substances and regulates the important potassium ratio ( $K_i/K_o$ ), thereby determining the excitability and electrical properties of the tissue. In Chapter III it is shown how rhythmic activity might be expected in animal tissues dependent upon the chemical dynamics of the



potassium ratio operating to determine the irritability and bioelectrical properties of tissue. Chapter IV involves a description of the temperature method of analyzing master reactions controlling behavior rhythms, as applying especially to problems of central nervous pacemakers. In Chapter V a hypothesis is advanced for the receptive function of lateral-line tissues, accounting for their minimal susceptibility to "adaptation" in terms of continuous intrinsic chemical changes affecting potassium ratio which are free from processes producing adaptation in other mechanoreceptors. In Chapter VI, following a consideration of the physiology of sensory adaptation, the "potassium hypothesis" is advanced to account for accommodation or sensory adaptation in mechanoreceptors. Whereas (as in nerve in vitro) repetitive stimulation should set up repetitive impulses at a rate limited only by speed of recovery processes in re-establishing excitability in terms of  $K_i/K_o$ , in the skin the repetitive stimulus soon becomes ineffective as a result of "the accumulation of K around the nerve fiber released from neighboring epithelial cells by the stimulus, thus increasing the  $K_o$  of the nerve ending and correspondingly decreasing  $K_i/K_o$ ." In dealing with central nervous pacemakers in Chapter VII, the author undertakes to show, in connection with the physiology of human time sense, "how the dynamics of the steady state may serve as a sort of 'chemical clock.'" "From all this it appears that the further elucidation of kinetic mechanisms of the type illustrated should be a desirable objective for students of the behavior of living organisms, whether these students call themselves biochemists, biophysicists, physiologists, botanists, zoologists, behaviorists, or psychologists."—T. C. Schneirla.

2672. Whatmore, George B., and Nathaniel Kleitman.

(U. Chicago.) The role of sensory and motor cortical projections in escape and avoidance conditioning in dogs. *Amer. Jour. Physiol.* 146(2): 282-292. 1946.—A method was devised for carrying out escape conditioning whereby the conditioned stimulus could be applied to a small spot on the body surface and the conditioned response could be limited to the discrete flexion of a single leg. The effects of hemidecortication on previously conditioned escape and avoidance leg-flexion responses were observed. To make the extent of the extirpation identical for each type of training, 2 escape responses and 2 avoidance responses were conditioned concurrently in the same animal. The conditioned stimuli and responding legs were so paired that a single hemidecortication would remove (1) the cortical projection of the conditioned stimulus for one response of each type, (2) the motor cortex of the responding muscles for the other escape response, and (3) the cortical projection of the unconditioned stimulus, plus the motor cortex of the responding muscles, for the other avoidance response. Hemidecortication had no effect on escape conditioning but caused complete abolition of that avoidance response for which the cortical projection of the unconditioned stimulus had been removed. Extension of the lesion to include the sensori-motor cortex of the remaining hemisphere still did not impair performance of the escape response. It was concluded that in avoidance conditioning, the cortical projection of the unconditioned stimulus occupies an important position in the neural pathways activated by the conditioned stimulus and that in escape conditioning there is no localized cortical structure necessary for elicitation of the acquired response.—G. B. Whatmore.

# ECOLOGY

Editors

ORLANDO PARK, *General Animal Ecology*

G. D. FULLER, *General Plant Ecology*

G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

FREDERICK A. DAVIDSON, *Ecology of Wildlife Management—Aquatic*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL and ANIMAL ECOLOGY]—Feeding of oysters in relation to tidal stages and periods of light and darkness, 2743; Symbiotic utilization of cellulose, 3015; Protozoa in sewage and filter beds, 3850; Septo-basidium-aphid symbiosis, 4074; Spruce sawfly in Quebec, 4598; Flagellates of termites, 4748; Mosquitoes of Uganda, 4839; Migration in Lepidoptera, 4858; Orientation in caterpillars, 4859; Color change in fish, 4885; Viviparous toads of Africa, 4896. [PLANT ECOLOGY]—Glaciated area of Siberia, 2677; Botanical indicators of air drifts, 2679; Soil micro-organisms and plants, 3921; Juncus in N. Wales, 4124; Vegetation of Michigan, 4149; Vegetation of wind-blown sands, Czechoslovakia, 4213; Soil moisture relationships during crop production, 4181; Associates of Abies alba, Belgium, 4339; Forest ecology, Portugal, 4345; Forest site studies, Canada, 4350)

## GENERAL

2673. Aichinger, E. Pflanzen- und Menschengesellschaft, ein biologischer Vergleich. [Plant and human community, biological comparison.] *Biol. Gen. [Vienna]* 17 (1/2): 56-79. 1943.—The author shows how plant associations, like human societies, are developed from pioneer settlements by gradual adaptive steps. In both cases, competition plays a decisive part; in both cases there are constructive, conservative, stabilizing, and destructive elements.—*Max Onno*.

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Season of birth and mental ability, 2622; Environmental influences on number of births and on sex ratio, 2626; Light intensities in forests, 2698; Climatic data and prairie habitat, Texas, 2705; Effect of light on molting in weasels, 2781; Temp. effects on O<sub>2</sub> consumption in tissues of clams, 2899; Heat rash, 3877; Soil moisture relationship during crop production, 4181; Daily rainfall and soil moisture, 4202; Rainfall and fruit gumming in plums, 4227; Weather conditions and migration of flea beetles, 4557; Humidity response in insects of stored products, 4580)

2673A. Becker, R. Die Kosmogonie der Atmosphäre. [Theory of cosmic origin of the atmosphere.] *Ann. Hydrogr.* 72(5): 144-148. 1944.—Discussion of the hypotheses of the origin of oxygen in the atmosphere: chemical hypothesis of Arrhenius, Weinberg's biological theory, Tammann's physical hypothesis, Trabert's and Himpel's cosmic hypotheses.—*Courtesy Bull. Amer. Meteorol. Soc.*

2674. Bernard, Merrill. Report of the Committee on Precipitation. *Trans. Amer. Geophys. Union* 27(2): 234-235. 1946.

2675. Conrad, V. Usual formulas of continentality and their limits of validity. *Trans. Amer. Geophys. Union* 27(5): 663-664. 1946.—The formula  $k = 1.7 A/\sin \phi - 20.4$  is a modification of Zenker's formula and  $k$  should give relative values of continentality.  $k$  is called continentality coeff.,  $A$  is the average annual range of temp.,  $\phi$  the geographical latitude. The formula seems to hold quite well for the surface of the earth but not within the low latitudes (about 15°N to 15°S). This difficulty is perhaps removed by a new modified equation which reads  $k = [1.7 A/\sin (\phi + 10^\circ)] - 14$ . For latitudes greater than 80°, the denominator,  $\sin (\phi + 10^\circ)$ , may be assumed to be unity. A quantitative characterization of continentality plays an important role in bioclimatological problems.—*V. Conrad*.

2676. Flint, Richard Foster, and Herbert G. Dorsey, Jr. Iowan and Tazewell drifts and the North American ice sheet. *Amer. Jour. Sci.* 243(11): 627-636. 1945.—A discussion of 2 conflicting concepts regarding the geographical and climatic origin of North American glaciation. The authors support the hypothesis that the glacial drifts were not derived from 2 originally separate "Keewatin" and "Labrador" ice sheets, but from shifting lobes of a single Laurentide Ice Sheet, developed by westward growth from initial glaciers occupying highlands in the northeastern part of the continent. Because of the relatively small difference between present climatic factors and those of the Wisconsin Glacial Age, use is made of observed relationships between large-scale weather changes and the general atmospheric circulation. Hypothetical climatic conditions in N. America during glaciation are de-

duced from probable major trends in the zonal circulation over periods of about 10,000 yrs. The concept of a single ice sheet, affected by fluctuating climatic conditions along its southern margin, is believed to be more consistent with present geological and meteorological knowledge than any other hypothesis thus far proposed.—*Courtesy Bull. Amer. Meteorol. Soc.*

2677. Flint, Richard Foster, and Herbert G. Dorsey, Jr. Glaciation of Siberia. *Bull. Geol. Soc. Amer.* 56: 89-106. 1945.—Delineates glaciated areas of Siberia, the relation to topography and the climatological events under which the former glaciers may have originated and grown.—*Courtesy Bull. Amer. Meteorol. Soc.*

2678. Hays, G. L. (Appalachian Forest and Range Expt. Sta., Asheville, N. C.) A method of measuring rainfall on windy slopes. *U. S. Dept. Commerce Month. Weather Rev.* 72(5): 111-114. 1 fig. 1944.—On irregular wind-swept slopes, accurate measurements of precipitation are impossible to make by regular methods. Special installations to eliminate wind effects were designed and put into use. Sloped orifice gages were installed in pits surrounded by splash preventing mats of excelsior covered by 1/2-inch hardware mesh. A conventional Forest Service type gage was installed about 2 feet above the ground also. Measurements were made at 7 stations, 6 on mountain slopes. The 6 stations on slopes were paired: one of each pair faced north, the other south. South slope stations were subject to greater wind effects than north as storm winds at exptl. station were predominately southerly. Differences between the catch of precipitation in sloped orifice and conventional gages were greatest when the gages were exposed to strong winds, and least when gages were sheltered. Results show that measurement of precipitation on wind swept slopes by conventional type gages cannot be sound aids in fire control in National Forests. Sloped orifice gages yield more accurate precipitation data.—*A. M. Allen*.

2679. Ives, Ronald L. (32 Laurel Place, Upper Montclair, N. J.) Botanical indicators of air drifts. *Ecology* 27(4): 364-369. 5 fig. 1946.—Localized altitudinal variations in plant distribution in areas of marked relief are in part caused by local air currents, existing during the growing season. Presence of such currents, in many instances, may be detd. from plant distribution. The general theory of these variations is shown diagrammatically; specific examples from the Colorado Front Range area are cited.—*R. L. Ives*.

2680. Kerner, F. von. Wechsel der Sonnenenergie in der geologischen Vorzeit. [Variation of solar energy in the geological past.] *Meteorol. Zeitschr.* 60: 389-391. 1943.—Fossilized flora in Silesia and laterite beds of the Eocene period in Germany indicate a much higher winter temp. than would result from the corresponding paleo-geographic conditions.—*Courtesy Bull. Amer. Meteorol. Soc.*

2681. Kimble, George, and Raymond Bush. The weather. 185p. Map, 16 fig. Penguin Books, Inc.: New York, 1946. Pr. \$0.25.—This is an American edition, rewritten from the British one of 1943, so that descriptions and data refer to conditions familiar to American readers. Though intended for general and popular consumption, the treatment is not superficial. It is closely packed with details and specific examples. Organized in such a way that important subjects are treated from different points of view in different chapters, and all parts are more or less readable without reference to preceding sections. Biologists and agriculturists will find interesting

the practical slants on many topics, one of the authors being a specialist in weather and horticulture. The book covers climatology, observations, weather phenomena, and forecasting, seasons, structure of the atmosphere, proverbs; physical explanations are given to a large extent. There is an excellent set of cloud photographs, but more diagrams would have been desirable.—*R. G. Stone.*

2682. Kohn, Irving. *Meteorology for all*. 162p. 68 fig. Barnes and Noble, Inc.: New York, 1946. Pr. \$1.00.—A very popular treatment in fluent and figurative style, but rather more accurate and effective than most attempts of this type. Very clear and simple presentation of basic principles is secured by suppressing details and technical terminology as much as possible. Many excellent diagrams are given. The organization and description is to a large extent cleverly carried out in analogies to biology, the contents being:—Physiology of the atmosphere: Diet, drink, blood pressure and circulatory system; Psychology of the atmosphere: The giants, Battle of the giants; Pathology of the atmosphere: Widespread congestion, Tropical fever, Psychopathy, Temporary blindness, Supercold; Geography of the atmosphere.—*R. G. Stone.*

2683. Lohman, S. W. Report of Committee on Ground Water. *Trans. Amer. Geophys. Union* 27(2): 236-278. 1946.

2684. Matthes, François E. Report of Committee on Glaciers. [Glacier variation.] *Trans. Amer. Geophys. Union* 27(2): 219-233. 1946.—The proofs of synchronism between the recent glacier oscillations in the Northern and Southern Hemispheres, which have been materially strengthened by Broggi's and Speight's observations, are held to be of far-reaching significance for the following reasons. (1) They warrant the inference that the causative climatic variations during the past 90 yrs. affected both hemispheres simultaneously, and not in alternation. (2) As these recent variations have been of a minor order, it may reasonably be supposed that the more pronounced variations during the post-Pleistocene interval also were synchronous in the two hemispheres. (3) There is even stronger reason to suppose that the major climatic variations of the Pleistocene epoch, which caused alternating glaciation and deglaciation on a continental scale, were synchronous in the two hemispheres. (4) It follows, further, that whatever the causes of these climatic variations of different orders may be, the synchronism of their effects in the 2 hemispheres rules out all theories, such as the so-called "astronomic theories" of Croll, Spitaler, and Milankovitch that demand refrigeration of one hemisphere and simultaneous warming of the other. Although the mathematical verity of those theories is not necessarily impugned, it is abundantly evident that the causes of climatic change, which they postulate, are wholly subordinate to certain other, far more potent, but as yet undetermined causes. (5) It follows that all the calculations of glacio-eustatic changes of sea level that are based upon the assumption of synchronous glaciation and synchronous deglaciation of the two hemispheres stand upon an essentially sound premise.—*Courtesy Bull. Amer. Meteorol. Soc.*

2685. Rangaiya, M. G. River flood control. *Current Sci.* 14(11): 291-295. 1945.—Outline of causes of destructive river floods and remedial measures generally adopted.—*Courtesy Bull. Amer. Meteorol. Soc.*

2686. Schneider, Otto. Sobre la interpolación y reducción de series climatológicas. *An. Soc. Cient. Argentina* 140(4): 257-302. 1945.—Review of the literature with examples worked out.—*Courtesy Bull. Amer. Meteorol. Soc.*

2687. Serebrenick, Salomão. Notas sobre o clima do Brasil. [Notes on the climate of Brazil.] 38p. Ministério da Agricultura, Serviço de Documentação: Rio de Janeiro, 1945.—Discussion and map of mean annual temp., followed by listing of extreme temps., a discussion of annual and diurnal variation, effective (bioclimatological) temps., humidity, winds, precipitation (with map of annual isohyets, map of season of rainfall), thunderstorms and other phenomena, and climatic types (with map). Tables give the monthly means of temp. (mean, max. and min.) and precipitation (amount and number of days) for the state capitals.—*Courtesy Bull. Amer. Meteorol. Soc.*

2688. Shedler, A. Interdiurne Veränderlichkeit des Luftdruckes und Ablauf des Wetters in Wien. [Interdiurnal variation of pressure and weather at Vienna.] *Meteorol.*

*Zeitschr.* 60: 364-368. 1943.—The sum of positive pressure variations exceeding 5 mm. is adopted as the measure of interdiurnal variation. The means of various meteorological elements are calculated for: (1) the 20 winter months when the sum of the variations was greatest; (2) the 20 winter months when the sum of the variations was lowest. Period used: 1891-1930. Case (1), the weather was mostly anticyclonic; case (2), cyclonic. The mean geographical pressure distribution for each case is shown.—*Courtesy Bull. Amer. Meteorol. Soc.*

2689. Stephan, J. Zum Tauprobem. [The dew problem.] *Biol. Gen. [Vienna]* 17(1/2): 204-229. 1943.—The author summarizes all known observations on dewfall and its ecological role for, and influence upon, plant life. He has observed that within Central Europe, dew formation during rainless fair weather periods increases considerably from SW to NE, probably in connection with the increasing nightly cooling and radiation, and that in regions with numerous lakes (e.g., Masuria) dew-formation is notably higher than in other regions. Generally, a considerable effect of dew upon water economy of plants is beyond doubt, even in Central European climate. It is expressed in a checking or lessening of transpiration, saving of water reserves, lessening of saturation deficit, and direct above ground water absorption by plants.—*M. Onno.*

2690. Zanon, Francesco Saverio. Nuovo contributo alla bioclimatologia di Venezia. *Geofis. Pura e Appl.* 6(1/2): 37-75. 1944.—Using meteorological data for 1929-43, and phenological data for 1940-43, the author has compiled a number of tables showing the microclimatic diversity of the air layer 2 to 4 meters above the ground. This causes irregularity in the times of leafing and flowering of herbs and low plants; the air layer above it is less diversified, causing a more uniform blossoming of fruit trees. The effects of minimum temp. and of the cooling power of the air are discussed.—*Courtesy Bull. Amer. Meteorol. Soc.*

#### ANIMAL

2691. Mackenzie, J. M. D. Some factors influencing woodland birds. *Quart. Jour. Forest.* 40(2): 82-88. 1946.—Birds play an important part in the control of forest insects. Factors influencing their distrib. and abundance include food, presence of nesting places, availability of materials for nest building, "song posts", and undergrowth. The order of abundance of birds in young tree plantations seems to be: (1) Sitka spruce; (2) Norway spruce; (3) *Cupressus macrocarpa*; (4) Douglas-fir, *Thuja*, *Abies grandis*, *Tsuga*, *Juniperus*; (5) Scotch, Corsican, and mountain pines; (6) Larch, yew, all broad-leaf spp. examined (birch, beech, oak, ash, maple, alder, willow, and poplar). Some birds prefer conifers, others hardwood trees.—*W. N. Sparhawk.*

2692. Shorten, Monica. (Oxford U., Eng.) A survey of the distribution of the American grey squirrel (*Sciurus carolinensis*) and the British red squirrel (*S. vulgaris leucourus*) in England and Wales in 1944-45. *Jour. Animal Ecol.* 15(1): 82-92. 5 maps. 1946.—In a questionnaire survey conducted in 1944-45, 77% of the total number of parishes in England and Wales and 96% of the 10 km. grid squares were covered. The grey squirrel was found to be present in 45% of the grid squares. In 1937 it was found in only 274 grid squares compared with 708 grid squares in 1944-45. 112 new squares have been added on the western boundary of the distribution. The eastern boundary of the grey squirrel has not changed markedly from the 1937 position. The reason for this limit is not known. The red squirrel was reported from 64% of the total grid squares covered. The red squirrel is present in 19% more grid squares than the grey squirrel. The red squirrel appears to be more widely and thinly distributed. Of grid squares occupied by the grey squirrel in 1930, 66% now have no grey squirrels. 25% of the total grid squares covered now contain both spp. Absence of squirrels of both spp. was reported for 16% of the grid squares. The apparent causes for the absence of squirrels were found to be lack of sufficient trees in fen, moorland, coastal or heavily industrialized areas.—*Auth. summ.*

2693. Von Brand, Theodor. (Catholic U. America, Washington, D. C.) Anaerobiosis in invertebrates. *Biodynamica Monogr.* 4: 1-328. 1946.—Methods used in the study of anaerobiosis are discussed. This is followed by a consideration of the O<sub>2</sub> content of a number of natural habitats of both



free-living and parasitic spp. The main groups of invertebrates are then surveyed with respect to abilities of their members to carry on anaerobic life, and the abilities of particular spp. to do so are discussed in relation to their normal habits and habitats. It is pointed out that there is often in nature a partial transition from aerobic to anaerobic metabolism dependent upon the  $O_2$  contents of the environment and other factors, and that animals fall into 2 not very sharply differentiated groups with respect to this characteristic—those reflecting even small changes in the  $O_2$  content of the environment and those showing no influence through a wide range. The occurrence and roles of fermentations in the presence of abundant  $O_2$  are surveyed. The sources of energy in normal anaerobic metabolism and the types of end-products formed and their fates both in the continued absence and in the restoration of  $O_2$  are discussed. The book is concluded with a brief discussion of the place of anaerobic processes in the general metabolism of invertebrates, the basis of differences observed among various spp. and theories of the origin of anaerobiosis in free-living and parasitic spp.—*F. A. Brown, Jr.*

2694. Wautier, J. (*Fac. Sci., Paris.*) Un milieu biologique particulier: le filtre à sable submergé. [A special biological milieu, the submerged sand filter.] *Bull. Biol. France et Belgique* 79(4): 326-328. 4 fig. 1945.—A sand filter for a town water supply near Paris was studied from the biological standpoint. Characteristics of this biotope are quite different from those of streams or ponds: water surface is still, although a flow of water goes downwards through a special bottom (sand of determined size). Pelagic spp. can be found in the biotic film on the sand, as well as bottom or bank forms. Overcrowding of organisms leads to an active struggle for life. Seasonal variations in the composition of the biological layer on the sand are studied. A list of the organisms found in the filter is included.—*J. B. Panouse.*

2695. Yepes, J. Rasgos generales de la fauna argentina de montaña. [General characteristics of Argentine mountain fauna.] *Rev. Argentina Zoogeogr.* 3(3): 113-121. 1943.—After consideration of the mountain environment, elevation is noted as one of the principal physical factors that influence the distribution of vertebrates. Altitude has more influence on mammals than on birds and reptiles, but these last are more affected by low temps. Passeriformes are typical examples of animals that are distributed according to different levels of elevation. The fauna of the Argentine highlands is typical. At lower levels, the fauna is more heterogeneous as a consequence of several influences discussed.—*J. A. Crespo.*

2696. Yepes, J. Observaciones y deducciones sobre letargo y temperatura en mamíferos. [Observations and deductions on lethargy and temperature in mammals.] *Rev. Argentina Zoogeogr.* 3(3): 123-128. 1943.—The research of students on the temp. of Argentine mammals is discussed. Lethargy is a transitory state of the organisms which is denoted by quietness, and a noticeable drop in body temps. that sometimes approach the temp. of their environment. Reserve fat tissues of marsupials are discussed. The author records the body temps. of the opossum (*Didelphis azarae*), armadillos (*Chaetophractus villosus*), and *Tamandua tetradactyla*. There is a table on body temps. of marsupials and edentates.—*J. A. Crespo.*

#### PLANT

2698. Balabán, K. [Light relations in beech, pine, and spruce forests.] (Ger. summ.) *Lesnická Práce* 21(2): 57-92. 18 fig. 1942.—Air and soil temps., intensity of light, and evaporation were studied in beech, pine, and spruce stands on cut-over lands. The study was carried on during different periods of the growing season and under different cloud conditions. Intensity of light in stands on cloudy days was 5% greater than on clear days. The relative coeff. of light utilization on clear days daily constitutes the following values: in beech stands, 0.01; in pine stands, 0.02; in spruce stands, 0.006. The same values on cloudy days are: in beech stands, 0.07; in pine stands, 0.19; in spruce stands, 0.05. The maximum relative coeffs. of light utilization on cloudless days were observed immediately before sunrise as follows: 0.21 in pine stands and 0.055 in spruce stands. The av. intensities of light during the summer from 8:00 A.M. to 6:00 P.M. on cloudless days constitute from 900 to

1500 Lx in beech stands, from 950 to 1700 Lx in pine forest, and from 250 to 500 Lx in spruce forest. The same values on cloudy days are from 1000 to 1200 Lx in beech forest, from 1500 to 2000 Lx in pine forest, and from 500 to 700 Lx in spruce forest. In spring a stand of defoliated beech receives on the av. of 60% of the total daily light. Foliated beech in summer receives only 4.5%. Stands of pine and spruce receive 5.5% and 1% of total daily light, respectively. On cloudy days defoliated beech stands received 65%, foliated beech 75%, pine 10%, and spruce 5% of the total light. Treeless patches of the stand which receive direct sunlight have a light intensity as much as 50,000 Lx greater than that observed in closed stands. Air temp. during the day in spruce stands was, on the average, 2°C higher than that in pine stands. In the early morning during the summer, air temps. are higher in forest stands than on cut-over lands (in pine stands 5°C, in spruce stands 8°C). Mean temps. in winter reaches its maximum at a depth of 25 cm. below the soil surface. In fall and spring the max. of the mean annual temp. is at the surface of the soil. The maximum temp. in summer is at a level 10 cm. above the ground.—*A. Némec.*

2699. Beard, J. S. (*Dept. Forest., Trinidad, B. W. I.*) The Mora forests of Trinidad, British West Indies. *Jour. Ecol.* 33(2): 173-192. 1946.—In Trinidad, forest in which mora (*Mora excelsa*) is dominant occupies a number of separate well-defined areas, alternating with mixed Crappo-Guatacare (*Carapa-Eschweilera*) forest (Evergreen Seasonal Forest of the author). Data are given on the composition of Mora forest, in which the dominant is nearly twice as abundant as all the associated species together and forms over 95% of the canopy. All the associated species of mora forest also occur in the Crappo-Guatacare forest and the composition of the former varies locally in conformity with that of the latter. No environmental factors appear to account for the replacement of mixed forest by Mora forest in certain areas. Mora is believed to be a recent arrival in Trinidad and to be invading the mixed forest actively at the present day. Mora is thought to have reached Trinidad from Guiana (where it is of wide distribution and not always gregarious) by a land bridge in late Pleistocene to sub-recent times. The open character of the Evergreen Seasonal Forest as compared with typical rain forest may have enabled mora to become gregarious in Trinidad and the great height and reproductive power of the species have helped it to suppress competitors.—*P. W. Richards.*

2700. Boer, A. C. Plantensociologische beschrijving van de orde der Phragmitetalia. [Phytosociological description of the order of the Phragmitetalia.] *Nederland. Kruidk. Arch.* 52: 237-302. 4 fig. 1942.—The Phragmitetalia comprise the Glycerieto-Sparganion, the (Eu)-Phragmiton, and the Magnocaricion elatae. In the Netherlands the Glycerieto-Sparganion is represented by 2 associations: the Glycerieto-Sparganietum neglecti and the Heliosciadium nodiflori; the Eu-Phragmiton by 3: the Scirpetum maritimae, the Scirpeto-Phragmitetum, and the Cicuteto-Caricetum pseudocyperus; the Magnocaricion elatae also by 3: the Caricetum acutiformo-paniculatae, the Caricetum elatae, and the Caricetum inflato-vesicariae. Of the Scirpetum maritimae the author distinguishes 4 subassociations, of which 3 are represented in the Netherlands: the Scirpetum maritimae typicum and the subassociations with *Alisma plantago-aquatica* and the *Puccinellia distans*. Of the Scirpeto-Phragmitetum, which is widespread in the Netherlands in eutrophic to mesotrophic bodies of water, an initial, an optimal, and a final phase are distinguished: they depend on the depth of the water layer in which the association is found. The Cicuteto-Caricetum pseudocyperus is the association developing on the swinging turf formed by the Scirpeto-Phragmitetum. The Caricetum acutiformo-paniculatae is the stage following on the Cicuteto-Caricetum pseudocyperus. With regard to the Caricetum elatae, the author remarks that in the Netherlands *Senecio paludosa* cannot be regarded as characteristic, for it is not confined to this association, but occurs in the Scirpeto-Phragmitetum and in the Scirpetum maritimae also. The Caricetum inflato-vesicariae and the much rarer Caricetum elatae are also stages in the succession of the vegetation developing in eutrophic water.—*C. E. B. Bremekamp.*

2701. Boulet, L. J. (*Dept. Agric., Québec, Canada.*)

Les principaux caractères botaniques et écologiques de nos divers groupements de pâturages. *Nat. Canadien* 73(6/8): 137-142. 1946.—Natural pastures are characterized by the following dominant grasses: *Danthonia spicata*, *Agropyron tenerum*, *Poa pratensis*, and *Festuca rubra*. Semi-natural pastures are maintained by the more or less continuous care of man and come to be characterized by *P. pratensis*, *F. rubra* and *Agrostis tenuis*. Of the sowed pastures, long-term pastures sowed with *Phleum pratense*, *Trifolium pratense* persist, but acquire some of the spp. of the natural pastures as co-dominants. Various spp. sowed for forage on a short term basis such as *Bromus inermis*, *T. hybridum*, *F. pratensis*, *Secale cereale*, *Brassica campestris*, etc., are unable to maintain themselves as pastures.—P. M. Patterson.

2702. Cain, Stanley A. The place of pollen analysis in paleo-ecology. *Chron. Bot.* 9(2/3): 106-114. 1945.—Pollen analysis has established 2 important facts: 1) The law of regional parallelism, which refers to the fact that a general climatic change produces in the various areas of a region comparable but not identical changes in the vegetation, so that it is possible to establish a geographic synchronism and cross-dating; 2) There is evidence that in recent centuries of postglacial time a climatic deterioration seems to have been taking place, and we may be slowly returning toward an ice age.—E. L. Core.

2703. Clarke, S. E., E. W. Tisdale, and N. A. Skoglund. The effects of climate and grazing practices on short-grass prairie vegetation in Southern Alberta and Southwestern Saskatchewan. *Canada Dept. Agric. Publ.* 747. 1-53. 11 fig. 1943.—Results of studies of native vegetation at the Dominion Range Expt. Station, Manyberries, Alberta, from the time of its establishment in 1927 up to 1939, are presented. The exptl. area consisted of 18,000 acres of native grassland in a semi-arid region of southeastern Alberta. Mean annual precipitation during the period was 10.7 inches while the average seasonal evaporation from an open tank was 33 inches. The soils are of the Brown zonal type and exhibit considerable surface erosion. The principal native grasses, in order of basal area occupied, were *Bouteloua gracilis*, *Stipa comata*, *Agropyron smithii*, *Koeleria cristata* and *Poa secunda*. The most abundant forbs were *Artemisia frigida* and *Phlox hodgei*. A dwarf clubmoss, *Selaginella densa*, was very abundant but of only minor importance. *Stipa comata* ranked first in total forage production with *Agropyron*, *Bouteloua*, *Koeleria* and *Poa* following in order. Soil moisture was the principal limiting factor for plant growth, and was usually deficient after mid-July or earlier. A close relationship was found between the seasonal precipitation: evaporation ratio and annual yields of range forage. The mean annual production from clipped plots (during the period 1931-1939) was 279 lb. per acre of air-dry forage. A 7-yr. expt. at different rates of stocking indicated that the grazing capacity was approx. 30 acres per mature cow for a 7-month season (April to Oct., inclusive). With heavier rates of use, the plant cover deteriorated and gains of the cattle were reduced. Results of tests of a 3-field system of deferred and rotational grazing were not conclusive. There appeared to be some benefit to the plant cover, but not the livestock, while costs of fencing and water development were increased. The principal effects of overgrazing on the native vegetation consisted of a decline in the abundance, vigor and productivity of the native grasses, especially the mid-grasses such as *Stipa*, *Agropyron* and *Koeleria*. Unpalatable herbs and shrubs increased with overgrazing. Marked changes in plant cover occurred during the study period as a result of climatic fluctuations. Decreases in abundance of desirable forage spp. occurred during a series of drought yrs. even on lightly grazed or protected areas. However, recovery was fairly rapid and there was no sign of permanent injury except on fields grazed beyond proper capacity. Applications of barnyard manure to native range resulted in marked increases in yield, with benefits from one treatment persisting for as long as 10 yrs. Burning of range pastures, either in spring or fall, caused reductions in forage yield for a period of 3-5 yrs. under moderate grazing use.—E. W. Tisdale.

2704. Cornelius, Donald R., and M. Donald Atkins. (Soil Conserv. Serv., Manhattan, Kans.) Grass establishment and development studies in Morton County, Kansas. *Ecology* 27(4): 342-353. 9 fig. 1946.—Revegetation studies

were conducted in Morton Co., Kansas. Blue grama, side-oats grama, and buffalo grass were planted on hard-land denuded range in 1942, 1943, 1944, and 1945. A mixture of blue grama, side-oats grama, little bluestem, sand bluestem, and sand lovegrass was planted on sand-sagebrush range land and on sandy-land farmed areas in 1941, 1943, and 1945. A good stand of grass was obtained from the 1942 planting on the hardland denuded range but the plantings for the three years which followed were not so successful, owing to insufficient moisture at critical times and to grasshopper injury. An excellent stand of grass was obtained in 1941 by planting in sand-sagebrush range land. Sand sagebrush was considerably reduced in vigor and size as a result of planting grass in the sand-sagebrush range land. The original grass cover of sandy-land farmed areas had been destroyed by plowing 5 to 20 yrs. before the drouth yrs. of the thirties. Active sand dunes were stabilized by planting sorghum for a cover and planting grass a yr. later in the mulch from the sorghum. Good stands of grass resulted in 1941, 1943, and 1945. Annual weedy forbs such as pigweed, sunflower, and Russian thistle disappeared from each of the 3 problem areas after satisfactory grass stands developed. This usually required 2-3 yrs. following the yr. of planting the grass seed.—D. R. Cornelius.

2705. Dyksterhuis, E. J. The vegetation of the Fort Worth Prairie. *Ecol. Monogr.* 16(1): 1-29. 11 fig. 1946.—This prairie is a widely recognized physiographic unit located in north-central Texas. From the Red River it extends 100 miles southward as a sharply defined belt of natural grassland on dark calcareous clays, some 10-30 miles wide, between the wooded, sandy, Eastern and Western Cross Timbers. It has supported an important ranching industry since 1860, though composition of the vegetation and grazing capacity have been impaired. This study, extending over the period 1939 to 1944, was a comprehensive, largely quantitative analysis of average vegetation, and major deviations including those associated with differences in grazing disturbance, relief, soils, and seasons. Standard procedures with slight modification were followed in gathering field data, but their assembly, analyses, and presentation follow original patterns. These were devised to meet needs for clear cut ecological guides in range management. The history of the area is long and significant from the standpoint of influence upon the vegetation. From Caddoan Indians in pre-Caucasian times, it has been pieced together to form a chronology of influences extending to the present. The climate is characterized by a growing season extending from March to Nov. with max. precipitation in Apr. and May and minima during winter. Av. snowfall is about 3 inches. The highest temps. occur in July and Aug. Geologically the area includes outcrops of the Washita and Fredericksburg groups of Cretaceous strata in n.-e. Texas. A columnar section shows almost horizontal alternate layers of limestone and marl. In geologic time these have eroded at distinctly different rates, causing flat topped hills or ridges with slopes consisting of benches alternating with steeper sections. The resulting "terraces" are an outstanding feature of relief influencing development of both soils and vegetation. The soils are classed as intrazonal Rendzinas. Though immature, they represent a relatively stable condition in soil development, and undisturbed vegetation upon soils of ordinary depths is considered climax. Average composition of vegetation in the grazing disclimax was detd. from 34 miles of cross-country transects that provided data on coverage and frequency for spp. with a coverage of over 0.3%. These data established the average or base from which to determine deviations due to special influences upon composition of vegetation. By comparing coverage and frequency of each important spp. in the broad area with its coverage and frequency in the late subser, and in relicts of climax vegetation, it was found that important climax spp. were all represented in the disclimax, but showed great differences in response to reduced disturbance. Also, numerous spp. of the disclimax were not represented in the climax, and differed greatly in response to reduced disturbance. The principal differences in composition of vegetation associated with differences in relief and soil were detd. by comparisons of averages of sample plots selected from different situations. The effect of differences in soil types, as commonly mapped, was found to be minor; effect of relief was obvious. However, clipping studies in conjunc-

tion with slope and soil analyses showed major differences in yields of forage to be associated with either soil type or relief. To determine seasonal development, weekly observations were made along a 2-mile course representative of the various habitats of the prairie. All spp. coming into blossom were recorded each week, as well as notes on general development. More extensive monthly trips were made to verify notes on general development. The wealth of spp., the long growing season, and the fact that development of both climax and disclimax spp. were studied provided a record of major seasonal differences in the vegetation. These were summarized semi-monthly for both climax and disclimax. Beginning in Sept., 1943, and ending Oct., 1944, pure natural stands of the 8 principal grasses were clipped to obtain data on yields per unit of area throughout the growing season. In addition, the year's growth for numerous spp. in 1943 was clipped on both deep and shallow soils in order to compare response of the same spp. in different habitats as well as the several spp. in the same habitat. It is concluded that the prairie was originally a part of the extensive True Prairie Association. Over the climax portion the major dominant was *Andropogon scoparius*. The present community is a grazing disclimax in which *Stipa leucotricha* and *A. saccharoides* are the major dominants. This degeneration occurred after 1880. Increase in coverage by *A. scoparius* affords a measure of the rate and extent of ecological succession on rangeland; while increase in *S. leucotricha* indicates ecological retrogression. A general increase of *A. scoparius* may be expected to be accompanied by a general increase of perennial forbs, excepting *Ambrosia psilostachya*, and by increases of *Bouteloua curtipendula* and *B. hirsuta* on shallow soils and of *Sorghastrum nutans*, and *Andropogon furcatus* on deep soils. Reduction in intensity of grazing disturbance may be followed by a temporary though marked increase in the coverage of *A. saccharoides*, *Schedonardus paniculatus*, and *Chloris verticillata*. Secondary succession over long periods may be expected to result in diminution of *Stipa leucotricha*, *A. saccharoides*, *Aristida* spp., *Buchloe dactyloides*, *Chloris verticillata*, *Schedonardus paniculatus*, *Triodia pilosa*, and the annual spp. as a group. The spp. of the disclimax may be grouped in 3 categories depending on behavior in the subere. These are: spp. that simply increase in relative coverage, spp. that decrease some in relative coverage after a period of increase, and spp. that are ultimately eliminated. Major differences in the composition of vegetation are associated with differences in relief. Major differences in the yields of forage may be associated with either soil type or relief. The stratigraphy of the prairie, insofar as it determined present relief, is indirectly responsible for major differentiation of the vegetation. Its effect is brought about through modification of the effects of climate upon development of both soil and vegetation. It has some effect on composition of vegetation but a much greater effect on yields. The amt., composition, and relative coverage of the vegetation on the same site varies continuously in this disclimax from late Jan. to Nov. This is brought about by an annually repeated succession of spp. having different periods of growth. There are annuals that characterize each of the 4 seasons. Different spp. begin blossoming in different months from Jan. to Oct. Rosette leaves of numerous perennial forbs develop in Oct. and remain green through the winter. The major climax grasses begin active aerial growth near the first of March and produce a ton or more of forage per acre by the first of June. Growth continues slowly through the remainder of the yr. but there may be a net loss in pounds per acre of forage during midsummer droughts, due to natural exfoliation. This may be followed by an increase beginning about Sept. 1. In contrast with the other perennial grasses, *Stipa leucotricha* begins growth about Sept. 1 and continues through winter, spring, and early summer until July when it commonly becomes dormant. It may show a net loss in weight of attached foliage in Jan. or after heavy frosts. The invading short grass *Buchloe dactyloides* may respond quickly and markedly to midsummer precipitation when tall and mid grasses do not. The grasses of the climax, as a group, produce more forage per unit of area than those of the disclimax, but over a shorter period. In the development of the subere there is an increase in the % of grasses of greater stature; an increase in the proportion of perennials; an increase in total coverage; and greater forage production. The full extent

of each increase is detd. by climate and is reflected in climax vegetation. Intermediate stages in secondary succession can be associated with seasons and intensities of grazing if qualified locally by consideration of relief and soil.—E. J. Dyksterhuis.

2706. Fagerström, Lars. Anteckningar om floran och vegetationen i Terijoki socken. I. [Notes on the flora and vegetation in Terijoki parish, Finland. I.] *Memoranda Soc. Fauna et Flora Fennica* 17: 121-142. 4 fig. 1941.—An account of the flora and vegetation of a peat-bog at Al-lingpää and of the humid forest meadows of the Rajajoki Valley is given. The vegetation of the bog is characterized as an eutrophic peat soil. The eutrophy is caused by the springs, which have the same importance here as limestone soils have elsewhere.—William Rosén.

2707. Feekes, W. De Piamer Kooiwaard en Makkumerwaard. *Nederland. Kruidk. Arch.* 53: 288-330. 1 pl., 3 fig. 1943.—Along the coast of the Province of Friesland (Netherlands) and just inside the former "Zuider Zee" there is a sand bank of 3 parts, separated by shallow channels; 2 of these parts are called "Piamer Kooiwaard" and "Makkumer Waard". In autumn and winter the bank is repeatedly inundated. Its soil is mainly sand, in places slightly mixed with clay. Changes in the vegetation brought about by the decreasing salinity of the soil and of the surrounding water have been studied since 1936. The pioneers belonged to the *Scirpetum maritimi* and to the *Puccinellietum distantis*. The latter, which in the Netherlands ordinarily occurs in fragments only, occupied an uncommonly wide stretch from 1933 to 1940, but now is rapidly dwindling. Of the *Scirpetum* 3 facies could be distinguished: *Schoenoplectus tabernaemontani*, *Scirpus maritimus*, and the *Phragmites communis*. The first-named facies, the pioneer community, is very variable. The *Scirpus maritimus* facies is the 2d stage in the succession. Where the vegetation is protected against the prevailing strong winds, the *Scirpetum* is invaded by the *Bidentetum*, and since 1940 also by a few willows. In the long run the *Scirpetum* may be replaced by the *Saliceto-Populetum*. The *Puccinellietum distantis* contained from the beginning 2 spp., *Puccinellia maritima* and *Agrostis stolonifera salina*, which increased so greatly that by 1940 they had ousted the typical representatives of the association. On low-lying parts the *Puccinellietum distantis* thus merged into the *Puccinellietum maritimae*; on higher and less saline spots an *Agrostis* facies developed, which may be regarded as intermediary between the *Puccinellietum distantis* and the *Armerieto-Festucetum*.—C. E. B. Bremekamp.

2708. Fisher, C. E., Jess L. Fuels, and Henry Hopp. Factors affecting action of oils and water-soluble chemicals in mesquite eradication. *Ecol. Monogr.* 16(2): 109-126. 1946.—Eradication of *Prosopis juliflora* var. *glandulosa* was studied over a 6-yr. period in Texas. Mesquite bears dormant buds on an underground stem and these buds must be destroyed in order to kill the plant. The effectiveness of oils and water-soluble chemicals in mesquite eradication is governed by their success in reaching these buds. Water-soluble substances, such as Na arsenite, when applied to the tops of the plants, were successful in the eradication when they move down the stem as far as the dormant buds. Movement of Na arsenite takes place in the outer rings of the xylem with little or no tangential movement. Factors affecting the success of Na arsenite application are the distance from the place of application to the dormant buds, the length of time it remains in contact with moist sapwood, the period of time the sapwood is exposed before the Na arsenite is applied, the conc. used, the presence of disruptions in the vascular system between the place of application and the buds, and the growth form of the plant. Insoluble herbicides, such as kerosene, are not transported in the vascular system and must, therefore, be placed directly in contact with the underground bud zone. Factors that determine the success of kerosene, when poured about the base of the trees, are the texture and moisture content of the soil and the growth form of the plant. Single to few-stemmed trees on pourous soils were killed with kerosene when an average of one quart per tree was used. Larger quantities are needed on heavier soils and with many-stemmed trees. Of the many water-soluble chemicals tested, Na arsenite was the most effective and economical. Of the contact herbicides, kerosene, diesel fuel, and other petroleum oils were equal in their effectiveness and the choice among them depended on cost and availability.



phenology and relations to other organisms, and an account of its post-Tertiary geological history, if known.—*E. L. Core.*

2726. Sørensen, Thorvald. The flora of Melville Bugt. *Meddelelser om Grønland* 124(5): 1-70. Map. 1943.—Melville Bugt is on the northwest coast of Greenland, from lat. 72°45' to 77°48' N., and is characterized by the small extent of the ice-free areas of land as a whole and by the absence of actual fjord localities. For botanical purposes it may be called an open skerry along the margin of the ice cap. Collections were made in 16 localities. Previous studies of the flora of N. Greenland are reviewed, and an annotated list of spp. found (87 in all) is given, with notes on frequency. The vegetation of Melville Bugt, discussed in some detail, contains the following types: 1) willow copses (*Salix glauca*) this being apparently the northernmost site of the type; 2) mixed dwarf-bush heath; 3) *Cassiope* heath, formed mainly on northern slopes and wherever snow persists long; 4) *Salix arctica* heath, found where the snow melts still later, *Cassiope* disappearing and *Salix* remaining alone with lichens, mosses and some herbs; 5) snow-patch vegetation proper; 6) fell-field proper; 7) *Dryas* heath; 8) herb-fields proper; 9) bogs, i.e., thick moss cushions; 10) dense moss cushions of drier soil; 11) heavily waterlogged marsh; 12) ornitho-coprophilous vegetation; 13) grassy meadows on flow-earth; 14) sandy-beach vegetation; and probably 15) *Puccinellia* beach meadows; and 16) littoral vegetation of *Fucus* spp.

2727. Thomas, A. S. (*Dept. Agric., Uganda, E. Africa.*) The vegetation of some hillsides in Uganda. Illustrations of human influence in tropical ecology. II. *Jour. Ecol.* 33(2): 153-172. 1946.—The catena system is used to describe the belts of vegetation on a hillside on the Sese Islands in Lake Victoria and 5 between Lake Victoria and Lake Kyoga, in Uganda. The hills are in the equatorial belt, with rainfall varying from over 20 cm. in the south to less than 10 cm. in the north. In general the 2 most southerly catenas show belts of short grassland on the hillsides, with closed evergreen forest on the tops and at the bases; the 2 northern catenas have woodlands on the tops and sides and more or less open grassland in the valleys. All hillsides show much evidence of human influence and some are now carrying a dense human population. Houses and cultivations are on the sides and tops of hills, rather than in the valleys. There is a great diversity of soils on each hillside, differing in color, reaction and phosphate, lime and potash content. The soils of inhabited areas are usually redder in color and richer in nutrients. The secondary nature of the vegetation is discussed and the ways in which man has altered it, by cutting forests, by burning, by conscious and unconscious encouragement of some indigenous spp. and by the introduction of exotics.—*A. O. Weese.*

2728. Wells, B. W. (*State Coll., Raleigh, N. C.*) Archeological disclimaxes. *Jour. Elisha Mitchell Sci. Soc.* 62(1): 51-53. 1946.—Three non-forest communities in forest areas which are believed to have been originated by prehistoric men are reported with the suggestion that these be recognized as "archeological disclimaxes." These are the Southern Appalachian grass balds (Wells), the heath areas of Jutland (Iverson) and East Anglia (Godwin) and certain grasslands of New Guinea (Quay and Lane-Poole). Good evidence indicates that these are initiated through forest clearance activities of prehistoric men and have resisted subsequent forest invasion to the present. These archeological disclimaxes, though rare, constitute unique communities, the true nature of which has only recently been recognized.—*B. W. Wells.*

2729. Wilkinson, John. Some factors affecting the distribution of the *Capreae* group of *Salix* in Gower. *Jour. Ecol.* 33(2): 214-221. 1946.—An acc. is given of the distr. of the *Capreae* group of *Salix*, comprising the spp. *caprea*, *atrocinerea* and *aurita*, and their hybrids inter se, in the Gower Peninsula (S. Wales), a limestone area covered by a thin veneer of drift. *S. caprea* occurs sparsely in well-drained upland situations, pH 5.8-7.3; *aurita* in high waterlogged regions, pH 4.1-4.8; and *atrocinerea* commonly in all low-lying wet situations, pH 4.5-6.5. Swarms of *caprea* × *atrocinerea* hybrids occur in regions of approx. neutral pH where the boulder clay thins out upon limestone. Rooting characteristics are also discussed in relation to distr. Shoots of *aurita* and *atrocinerea* root easily in stagnant cultures; *caprea* roots reluctantly only with aeration, which explains

the occurrence of this sp. where the soil-type tends to be oxidizing.—*John Wilkinson.*

2730. Williams, C. B. An insect-catching grass. *Entomologist* [London] 78(982): 37-38. 1945.—Note on a sand-burr grass, *Cenchrus myosuroides*, found in Ecuador catching large numbers of small insects by its sticky spined heads.—*Courtesy Expt. Sta. Rec.*

2731. Zoller, H. Geographische Studien an der Schaffhauser Weinbau-Ackerbau-Gemeinde Osterfingen. [Geographic studies of the Schaffhausen viticulture and agriculture community of O.] *Ber. Geobot. Forschungsinst. Rübel Zürich* 1945: 80-87. 1946.—The relation of natural vegetation and economic life in this Swiss community shows that besides wine and cereals, forests are the chief sources of revenue. They consist of Fagetum praealpino-jurassicum on the northern slopes, whereas on the southern slopes there is from bottom to top a gradual transition from Querceto Carpinetum through Fagetum to Querceto-Lithospermetum. *Bromus erectus* dry meadows play a great part.—*Max Onno.*

## OCEANOGRAPHY

(See also Entries 2740, 2751, 2859, 4061)

2732. Doty, Maxwell S. (*Northwestern U., Evanston, Ill.*) Critical tide factors that are correlated with the vertical distribution of marine algae and other organisms along the Pacific Coast. *Ecology* 27(4): 315-328. 6 fig. 1946.—The intertidal organisms of the coast of northern California and Oregon appear in horizontally extensive zones with sharp upward and downward limits of distribution. These zones are described along with the nature of the critical tide factors that seem responsible for their delimitation. These zones occur between the following tide levels: below the level of the lowest of the low waters; between the level of the lowest of the low waters and mean lower low water level (approx. 0.0 of tidal data for the region); between the latter level and the level of the lowest of the higher low waters; between the latter level and the level of the highest of the higher low waters; between the latter level and the level of the lowest of the lower high waters; between the latter and the lowest level of the higher high waters; and finally a zone dependent upon local conditions between the latter level and the upward limits consistently moistened by spray.—*M. S. Doty.*

2733. Filatova, Z. A. Kolichestvennyi uchet donnoi fauny iugo-zapadnoi chasti Barentsova Moria. [A quantitative evaluation of the bottom fauna of the southwestern part of the Barents Sea.] *Poliarnyi N.-I. Institut Morskovo Rybnogo Khoz'istva i Okeanografii, Trudy* [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk] 2(1): 3-58. 3 maps, 6 fig. 1938.—The work presented is based on 196 bottom samples taken by several kinds of collectors. The biomass of the fauna varies from 2 or 3 grams to several kg. per sq. meter (based on alcohol wt.). Richest faunas occur near shore and at the edges of banks. The faunas found are divided into 12 complexes or communities, each being characterized as to what species, in it, are dominant, secondary or unimportant. The zoogeographical relationships of these complexes are described. A best boundary between "Boreal" and "Arctic" faunas is established.—*W. E. Ricker.*

2734. Kiillerich, A. On the hydrography of the Greenland Sea. *Meddelelser om Grønland* 144(2): 1-63. 11 maps (3 col.) 1945.

2734A. Mantefel, B. P. Plankton i seld v Barentsovom More. [Plankton and herring in the Barents Sea.] *Poliarnyi N.-I. Institut Morskovo Rybnogo Khoz'istva i Okeanografii, Trudy* [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk] 7(3): 125-218. 21 fig. 1941.—The study of the plankton of the Barents Sea is based on 10,212 samples from 3276 stations, taken 1931-39. In the southern part of the Sea there is a spring "flowering" of phytoplankton, followed by a marked development of infusorians (especially *Strombidium*), followed in turn by juvenile crustaceans (*Calanus* and Euphausiacea), resulting finally in the annual maximum of zooplankton in June. This is the "red feed," largely *Calanus*, which herring consume eagerly; during the months of its abundance (May-July) their fat content increases from 3 up to 23% of the body wt. This store is drawn upon in winter, when the herring descend to deep waters and almost entirely cease feeding. By Mar. or Apr. their fat reserve is almost gone, and they rise and begin

feeding below the zone of abundant phytoplankton, on *Calanus* and adult Euphausiacea descending from it. Certain yrs. exhibit more or less marked deviations from the above picture. In the spring of 1938 plankton was scarce, a condition apparently related to the occurrence of unusual numbers of the plankton-eating ctenophores *Bolina* and *Beroë*. This delayed the summer fattening of the herring by a month, lowered the average level of fatness achieved, and reduced the rate of growth. Profitable herring fishing requires the existence of the fish in sufficiently dense schools, in accessible places. The existence of such schools is related to the plankton growth in a rather complex manner. Drift net catches and echo-sounder records show that during May and June the herring live in rather small groups in the region of the *Calanus* development, and are nowhere assembled in commercial quantities. In early July these groups fuse into dense schools, which tend to inhabit the regions having the heaviest concentrations of *Calanus*. This positive correlation between the distribution of herring and that of their food is of short duration, however. By Aug. it has changed to a negative correlation: that is, the dense schools of herring apparently effect a marked reduction in the *Calanus* population in their immediate vicinity. Later *Calanus* becomes scarce everywhere, and no correlation can be found between it and the presence of herring schools. Still other correlations can be demonstrated between plankton organisms and herring schools: herring avoid the zone of dense phytoplankton growth, either dropping below it or moving away from it, and the border of this zone, as it retreats northward in spring, is often followed by considerable herring shoals. During late summer warm-water organisms like *Bolina*, *Beroë*, *Evadne*, *Oithona*, etc., are positively correlated with herring abundance, while cold-water forms like *Limacina*, *Mertensia*, *Sarsia*, etc., are negatively correlated. Thus the use of plankton sample to locate likely herring fishing areas is quite practical, but requires greater skill than is necessary in the case of the simple correlations which have been used on the North Sea.—*W. E. Ricker*.

2735. Pomerat, C. M. (*U. Texas Med. Branch, Galveston*), and C. M. Weiss. (*Woods Hole Oceanogr. Inst., Woods Hole, Mass.*) The influence of texture and composition of surface on the attachment of sedentary marine organisms. *Biol. Bull.* 91(1): 57-65. 1946.—Submerged samples of 40 different construction materials were used as substrates for the collection of sedentary populations. The barnacle counts in the populations ranged from 980 on asbestos shingles to zero on zinc and on 2 paint coatings, after 3 months' immersion in Biscayne Bay at Miami Beach, Florida. Various surface textures of glass plates were found to exert no significant influence on the accumulation and growth of sedentary marine organisms, although smooth clear glass accumulated smaller populations in the comparatively short exposure periods, 1-3 months. The results suggest that efficiency of a substrate as a fouling collector is in general correlated with porosity of surface or with fibrous nature of surface. Smooth, non-porous, non-fibrous surfaces, especially if also hard, seem to be poor accumulators of sedentary organisms.—*C. M. Pomerat*.

#### LIMNOLOGY

2736. Butcher, R. W. Studies in the ecology of rivers. VI. The algal growth in certain highly calcareous streams. *Jour. Ecol.* 33(2): 268-283. 4 fig. 1946.—Quantitative estimations of the algal growths on the river beds of the Itchen, Test, and Hampshire Avon have been made for more than a year at frequent intervals. Total quantities fluctuate considerably but show generally a single annual cycle with maximum in midsummer and minimum in winter. The av. quantity increases downstream in response, it is suggested, to the progressive eutrophication of the water. The average nos./sq. mm. of glass-slide surface lie between 2000 and 10,000, a quantity found in all eutrophic waters. Quantities are larger where the current is fast than where it is slow. There is a single algal community throughout the yr., dominated by *Cocconeis*, *Ulothrix* and *Chamaesiphon*. There are a few other algae that vary markedly in quantity, e.g., *Gomphonema*, but their maxima have not been at the same time each yr. Apart from these, there appears to be no seasonal variation. The above community increases with the progressive eutrophication of any river and is considered to

represent the climax association of algae in any river. Marked differences in the community were observed in a pond fed by and adjacent to the river, and these differences are assigned to the physical fact of movement of the water over the algal film. An explanation of the calcium crust is suggested.—*Auth. summ.*

2737. Geitler, L. Zur Kenntnis der Bewohner des Oberflächenhäutchen einheimischer Gewässer. [The superficial film of Central European waters.] *Biol. Gen. [Vienna]* 6(4): 450-475. 10 fig. 1942.—Results of neuston observations from the Lunz lake in the Lower Austrian Alps are given. Typical epineustons, i.e., organisms living upon the water surface, proved to be far more frequent than was hitherto supposed. They are provided with special arrangements for emerse development, such as floating discs or difficult moistening of membranes. Among known (but misunderstood) forms there belong here the Heterocont *Botrydiopsis arhiza* with the vars. *punctata* and var. *smaragdina* (*Chromulina* s. Gicklhorn), and various Protococcaceae described by Korshikov; *Nautococcus emersus* and RHEXINEMA paucicellulare; and also *Chromulina rosanoffii* and the protococcal genera *Emergococcus* Miller and *Emergosphaera* Miller. Facultative epineustons are *Raphidium falcatum* and *Stichococcus bacillaris*. It is doubtful if there are any obligatory hyponeustons (i.e., organisms living under the superficial film). The hitherto supposed ones proved to be epineustons. The composition of neuston changes rapidly, esp. epineustons can be attacked and destroyed by Phycomycetes or Rhizopods.—*Max Onno*.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 3558, 3887, 4765, 4884, 4887, 4891)

2739. Beaven, G. Francis. Annual report Chesapeake Biological Laboratory, 1942. *State Maryland Dept. Res. and Educ. Publ.* 56. 1-35. Map, 2 fig. 1942.—An outline of work done on studies of plankton, the blue crab, the oyster, hydrographic studies, pollution, fishes, hatcheries, and botanical studies.

2740. Boldovskii, G. V. Pishcha i pitanie seldei Barentsova moria. [Food and feeding of the herring of the Barents Sea.] *Poklarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk]* 7(4): 219-286. 12 fig. 1941.—The food of the immature "Murmans" herring in the southern Barents Sea was studied from 827 samples comprising 52,848 herring. Their principal food is *Calanus finmarchicus* (65% by wt.) and Euphausiacea (28%). The herring start active feeding in Mar. or Apr., taking euphausiids principally. As spring wears on *Calanus* becomes increasingly important, and finally dominates the picture in June. Through July it again gives way to the euphausiids; the latter retain their predominant position until the following May. The late summer and autumn months are marked by a sharp decrease in quantity of food in the stomach, but a considerable increase in its variety: larval fishes and decapods, *Sagitta*, *Limacina*, etc. occur most frequently at this time. There is little suggestion of change in feeding habits with increasing size among these herring, except that in late summer the larger ones tend to take fish larvae while the smaller ones eat mostly crustaceans. The seasonal changes in amount of food found in the stomachs do not seem to be wholly detd. either by temp. or by abundance, because the spring period of active feeding starts at a time when both the temp. and the mass of the animal plankton are at their annual minima. Otherwise plankton and stomach contents are well correlated. However, since no exact information on rate of digestion is available, the total consumption of food at different times of yr. cannot be computed. During most of the yr. herring in the western part of the southern Barents Sea contain more food than those farther east, but in winter the central part of the sea is most favorable. Variations in quantity and species composition of the plankton, from yr. to yr., are reflected in the contents of the stomachs. Mean annual water temp. is inversely correlated with amt. of food. Herring begin to increase in length, each season, only about 2 months after they begin active feeding. Except in July, herring from large schools are less well fed than those taken from smaller ones.—*W. E. Ricker*.

2741. Herman, Elmer F. (*Wisconsin Conserv. Dept., Madison*.) Notes on the effect of cauterization in fin-clipped



trout. *Copeia* 1946(2): 96. 2 fig. 1946.—Three tanks of 55 mixed brown and rainbow trout were used to test the effect of cauterization on clipped dorsal fins. One tank was used for controls, another held fish with the dorsal fins clipped and the 3d held fish which were clipped and cauterized. A yr. after the expt. was initiated, 88% of the clipped fish exhibited various stages of regeneration of the dorsal fin. On the same date, 98% of the clipped and cauterized trout showed no regeneration whatsoever. The cauterizing instrument was a Thordarson (T-19F89) transformer delivering 25 volts at 10 amperes through a nichrome resistance wire.—S. D. Gerking.

2742. Hora, Sunder Lal. Stocking of tanks. *Indian Farming* 5(4): 163-164. 1944.—Before stocking with fish tanks should be drained, desilted and have a crop raised on the bottom. Then they should be refilled with water snails and aquatic vegetation started. Only fast growing spp. of *Labeo* and *Barbus* should be stocked. The number of fish to be stocked can not definitely be stated but may be around 2 for each 100 cu. ft. of water.—Joseph Hamilton.

2743. Loosanoff, Victor L., and Charles A. Nomejko. (Fish and Wildlife Serv. Marine Lab., Milford, Conn.) Feeding of oysters in relation to tidal stages and to periods of light and darkness. *Biol. Bull.* 90(3): 244-264. 1946.—Studies made in Long Island Sound and Milford Harbor showed that during all hrs. of the flood and ebb the predominating majority of the oysters (*Osireia virginica*) contained large quantities of food. The relative quantities of food during the ebb were at least equal to, or sometimes exceeded, those recorded during the flood. The rate of water pumping of oysters indicated that they feed actively at all tidal stages. The vol. of water filtered by the oysters through their gills during 1 hr. may be >1500 times greater than the vol. of the body of the oysters. Within the temp. range of 17 to 28°C the oysters remained open on an av. of 94.3% of the time. During flood they were open on an av. of 93.4% of the time and during the ebb periods, 95.2%. At night the % of oysters with full stomachs was comparable to that of the individuals examined in the day time. During darkness the oysters fed actively. The av. rate of pumping was not lower than during daylight. No correlation was found between the periods of closure of the shells and darkness. Under favorable conditions, neither tidal changes nor changes in the time of day affected the rate of feeding. The results do not support the theory that the American osyter does not feed late at night and in the early morning, and is relatively inactive on the ebb tide.—V. L. Loosanoff.

2744. McKenzie, R. A. The haddock fishery of grounds fished by Canadians. *Fish. Res. Bd. Canada Bull.* 69: 1-30. 19 fig. 1946.—Canadian haddock fishermen operate in all waters off the Canadian coast and also on St. Pierre and Grand banks off southern Newfoundland. Few haddock are caught in these waters by Newfoundland fishermen, but U. S. fishermen take slightly more haddock in these waters than do the Canadian. Considering the yrs. 1938 to 1940, inclusive, the grounds off s.-w. Nova Scotia yielded the most haddock to the international fishery with western Browns bank leading, the cape Sable Lockport shore area 2d and eastern Browns and LaHave banks 3d. In the Canadian fishery the Nova Scotian side of the bay of Fundy ranked 1st, the Lockport shore region 2d and St. Pierre bank 3d. Canadian production is about half from inshore and half from offshore ground with the latter catch being divided almost equally between steam druggers and the large vessels. In winter most of the haddock comes from offshore directly off Halifax, in spring from Cape Breton shore waters, summer from the Digby and Lockport shore areas and St. Pierre bank and in the autumn the Cape Breton yield again plays an important part. Canadian haddock have been tentatively divided into 4 stocks which yield the following proportions of the Canadian landings—eastern Nova Scotian 45%, s.-w. Nova Scotian offshore 4%, outer Nova Scotian coast inshore 19%, and the Nova Scotian Fundy 21%. The remainder of the Canadian catch (11%) comes from St. Pierre bank off southern Newfoundland.—R. A. McKenzie.

2745. McKenzie, R. A. The smelt fishery of northeastern New Brunswick. *Fish. Res. Bd. Canada Bull.* 70: 1-20. 10 fig. 1946.—Beginning about 1872 this fishery has grown until in recent yrs. it ranks 12th or 13th in value among Canadian fisheries, yielding an average annual catch of 7-8

million pounds. Of this, the Miramichi River produces  $\frac{1}{3}$ , the rest of New Brunswick  $\frac{1}{3}$ , and Nova Scotia, Prince Edward Is. and Quebec the remainder. While the landings in the Miramichi region from 1911 to 1940 have on the whole steadily declined, there has been enough increase in other Maritime areas to maintain a fairly uniform level in the total Canadian landings. Fishing takes place during the late autumn and winter, about 95% of the catch being made in nets set under the ice, which forms in protected coastal waters. "Bag" nets, "square" nets and several types of "box" nets comprise the gear used under the ice. The first 2 depend on the smelt being carried in with the current, while in the last the fish swim along the leader into the "box". In all types a small funnel-like mouth makes it difficult for the fish to find their way out. In open water fishing gill nets and bag nets are used. Smelt fishing usually is carried on within a mile or so of shore and the gear is tended daily, weather permitting, the fishermen using hand-sled, dog-sled, horse and sleigh, car or truck (snow conditions permitting) to transport equipment and catch. The smelt, frozen on the ice, are collected by buyers and turned over to big trucks which take them to packing sheds where they are graded as to size and packed while still frozen usually in 10- or 15-pound boxes.—R. A. McKenzie.

2746. McKenzie, R. A. The Canadian Atlantic halibut fishery. *Fish. Res. Bd. Canada Bull.* 71: 1-29. 15 fig. 1946.—For some yrs. previous to 1938, and since 1940, one and sometimes several large vessels of the Lunenburg "Blue-nose" type specialized in offshore halibut fishing off the Canadian Maritime coast. However, during 1938 to 1940 halibut fishing was so good that more than the usual number of large vessels engaged in it. Some special halibut fishing is also conducted inshore off Cape Sable Island. From 1930 to 1940, inclusive, the annual Atlantic halibut landings made up about 15% of the Canadian total, or approx. 30,000 cwt., valued at \$250,000. Most of this was caught while "ground fishing" and a dozen such fares during May to Nov., inclusive, 1940, only totalled about 15,000 lb. of halibut in almost 1,700,000 lb. of total catch of fish. 65% of this called "small medium white", i.e., from about 12 to 45 lb. in wt., 23% was still smaller, and the remainder was over 45 lb. In contrast with the Canadian Pacific fishery, the Atlantic halibut fishery was principally a by-product of the cod and haddock fishery. At least 75% of the catch was made when in pursuit of the latter fish. The U. S. Atlantic halibut fishery,  $\frac{3}{4}$  of which was on so-called Canadian Atlantic grounds, was only  $\frac{1}{4}$  to  $\frac{1}{2}$  that of the Canadian fishery. About 40% of the Canadian Atlantic halibut were caught during inshore and 60% during offshore operations.—R. A. McKenzie.

2747. Marti, Iu. Iu. Materialy k biologii treski Murmanskovo poberezhia. [A contribution to the biology of the cod of the Murman coast.] *Poliarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk]* 3(1): 3-38. 4 fig. 1939.—Marti presents a critical review of present knowledge concerning the cod found along the Murman coast, based largely but not exclusively on published accounts. Two types of cod occur along this shore. The local Murman race lives all its life along that coast, spawning in its bays and fjords. It differs morphologically from the oceanic cod, as well as in habitat. It is much less numerous than the oceanic type, and contributes little to the fishery. Oceanic cod come to the coast in large numbers in early spring, following the capelin on their spawning migration. These schools consist principally of immature fish. Tagging expts. show that they leave the coast in 2 directions—southwest along the Murman coast and into neighboring shallow waters, and also to the southern slope of the Gusin Bank.—W. E. Ricker.

2748. Marti, Iu. Iu. Issledovaniia zhiznennogo tsikla Murmanskoi seldi. [Studies on the life cycle of the Murman herring.] *Poliarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk]* 7(2): 38-124. 18 fig. 1941.—The author gives a profusely-documented and well-illustrated account of the life cycle of the Murman "nation" of herring, which is the dominant form in the Barents and White Seas. It is based on the commercial drift-net fishery, special drift-net and trawl catches, examination of stomachs



of piscivorous fishes, and numerous plankton hauls for larvae. The Murman herring spawn in April, on banks lying offshore from the southernmost Lofoten Is. to the North Cape of Norway. The larvae drift with the prevailing currents in 2 principal groups—eastward and northeastward. The former or southern group travels 3.5 miles a day; a part of its members have a "littoral" stage, inshore along the Kola Peninsula, but others do not. By their first winter the young herring have reached Cape Sviatoi Nos (Sacred Nose) and the Gussin Bank, on the southern route; on the northern route they have been traced to the Demidov Bank. During winter the young herring are quiescent, lying near the bottom of the Sea. In their 2d summer they disperse themselves actively as far as the most eastern and southern parts of the Barents Sea, and into the White Sea; the northern boundary of their range is irregular, but extends half way up the island of Novaya Zemlia. The following winter is spent in much the same places, even though the temp. fall below zero. At age 3 seasonal migrations begin. Even in summer they tend to avoid the cool eastern part of the Barents Sea, and congregate in the region from the entrance of the White Sea to Demidov Bank, and westward; in winter they migrate to the extreme western (warm) part of the Barents Sea, where they can be taken in trawls. This pattern is maintained by age-groups from 3 or 4 to 6 or 7—the so-called "fat" herring. First maturity usually occurs at age 5 or 6. Shoals of mature herring congregate in late autumn and move to the spawning grounds during winter. The oldest herring (ages 7-15) are rarely found within the Barents Sea proper, but perform seasonal migrations from the spawning grounds off the Lofoten Is. northward to Bear Island and Spitsbergen, and return. These fish have wrongly been considered part of the stock of Norwegian (as distinct from Murman) herring by Einar Lea. —W. E. Ricker.

2749. Milinskiĭ, G. I. *Biologiya i promysel morskoi kambaly (Pleuronectes platessa) Barentsovo Moria*. [Biology of and fishery for the plaice of the Barents Sea.] *Poliarnyy N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk] 2(2): 59-92. 4 fig. 1938.*—Plaice live in only a small region of the sea, along the Murman coast and adjacent banks. After 5-6 yrs. of life in shallow water, the plaice move out to greater depths, but return shoreward in winter. Age can be detd. from scales with fair accuracy. Growth is slow; the mean length of age V fish is 30 cm.; of age X, 40 cm. However, work done during the period 1906-14 shows that growth then was much slower yet; the change is ascribed to the thinning of the stock by the fishery. After 10 yrs. the rate of growth of ♀♀ significantly exceeds that of ♂♂, and at the same time the former begin to exceed the latter in number, so that very few ♂♂ are taken older than XV yrs. Females older than age XX are likewise rare. Maturity is achieved by ♂♂ at 8 or 9 yrs. of age, by ♀♀ at 10-12 yrs. Plaice have been caught in the Barents Sea since the early yrs. of the century, reaching a peak of 15 million kg. in 1909. English trawlers have always dominated the fishery, though many nations take part. In recent yrs. (through 1935) the annual catch has been 2-5 million kg. —W. E. Ricker.

2750. Solovieva, N. *Vremia zokladki zimnikh kolets i nachala prirosta na cheshue seldi (Clupea harengus harengus) v razlichnykh raionakh Barentsovo moria*. [The time of formation of winter rings and the beginning of growth of the scale of the herring in various parts of the Barents Sea.] *Poliarnyy N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk] 2(4): 109-129. 7 fig. 1938.*—The time at which the annulus ("winter" ring) on the scale is laid down varies from Aug. to Dec., in different fish. It averages later among young fish than among older ones, and is also later among herring from the open sea, as compared with those living near shore. The latter situation is cooler and less rich in plankton foods. Herring whose scale growth, and presumably body growth, ends in Aug., cease growing at the middle of the hydrological summer, but after the maximum of available food is past. Thus food rather than temp. appears to determine the time of its appearance. Scale growth starts again in May, a considerable time after active feeding has been resumed. Growth is renewed first at the outer edge of the scale and spreads proximally, though in the fall the annual

ring begins to form at the base, and spreads distally. —W. E. Ricker.

2751. Zatepin, V. I. *Pitanie pikshi (Melanogrammus aeglefinus) v raione Murmanskovo poberezhia v svyazi s donnoi faunoi*. [Food of the haddock of the Murman coast in relation to the bottom fauna.] *Poliarnyy N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii, Trudy [Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk.] 3(2): 39-97. 5 fig. 1939.*—Contents of the stomachs and intestinal tracts of 3435 haddock were compared with the fauna of the sea-bottom, as shown in over 400 grabs of the Petersen dredge. From 2 years of age, haddock are predominantly bottom feeders, and consume chiefly Ophiuroidea, Lamelli-branchiata, Polychaeta and Gephyraea. The older haddock take considerable quantities of spawning capelin and their roe, in spring. Both in the coastal region and in the open sea, the food tracts contain most food when taken from depths where the temp. is in the range 1°-3°; in the range -1° to +1°, or 3° to 6°, the "index of fullness" is much less. The bottom faunas of the Barents Sea can be divided into two principal types, the "epifauna" type consisting largely of animals which feed by filtering seston from the water, and the "infauna" type consisting largely of animals that inhabit the ooze and eat it or its inhabitants. The former type is restricted to regions of strong currents, and is much less utilized by haddock for feeding than is the latter. Among the animals of the "infauna" type, the smaller forms, lacking heavy armor, are preferred. Average densities of total fauna and of fauna edible to haddock are computed for all the 10 faunal complexes recognized in the southern Barents Sea. Comparisons of haddock food with that of various flatfishes show differences which may be associated with differences in mouth structure, etc., and with differences in range and behavior. However, mean differences between spp., in respect to food taken, are less than the variations found within any given species. —W. E. Ricker.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 2692, 3556, 4165, 4166, 4169, 4296, 4774, 4947, 4971)

2752. Bennett, Rudolf. (U. Missouri, Columbia.) Report on a three-year quail stocking experiment. *Missouri Conservationist* 7(6): 10, 11. 3 fig. 1946.—In every state there is still a substantial body of citizens who believe that restocking, in itself, can build up a population of wildlife. A demonstration under Missouri conditions seemed desirable and the Conservation Commission requested the cooperation of the Wildlife Research Unit in carrying it out. Two areas similar in size, land use and soil were selected and one of these was stocked with pen-reared quail in the spring of each of 3 yrs. at the rate of 60, 60 and 63 pairs. Spring and fall censuses were conducted each year on both areas. The results showed that stocking produced no discernible effect on populations in the stocked area, and served to emphasize the fact that it takes carrying capacity to support wildlife. —W. O. Nagel.

2753. Calhoun, John B. (Northwestern U., Evanston, Ill.) Distribution and food habits of mammals in the vicinity of the Reelfoot Lake Biological Station. *Jour. Tennessee Acad. Sci.* 16(1): 177-185. 1 fig. 1941.—Relative numbers of small mammals in different habitats were detd. by using snap-traps for 3 consecutive nights in 42 quadrats  $\approx$  250 ft.<sup>2</sup>, spaced in most cases > 100 yds. 2380 trap nights yielded 119 specimens of 7 spp. Actual population densities were estimated. All stomachs of these, and those of larger mammals and bats obtained by shooting, were preserved for food-habits study. An index of prey importance (based on numbers, not mass) was calculated. Of the small mammals *Mus musculus* was the most abundant (42.5 per acre). Lepidoptera were the most important prey for *M. musculus*, *Oryzomys palustris* and *Peromyscus leucopus*. Coleoptera were most important for *Blarina brevicauda* and *P. gossypinus*. The paper is to be continued. —R. M. Bond.

2754. Cottam, Clarence. (Div. Wildlife Res., Fish and Wildlife Serv., Chicago.) Research problems on the United States National Wildlife Refuges. *Trans. North Amer. Wildlife Conf.* 10: 347-353. 1945.—On June 30, 1943, the Fish and Wildlife Service administered 275 national wildlife refuges, with an aggregate of 17,620,526 acres. Of these, 256 (9,573,551 acres) are in the U. S., and 19 (8,046,975 acres) in Alaska, Hawaii, and Puerto Rico. All kinds of wildlife are

protected on these refuges, but many refuges were especially established for the conservation of one or more species: 188 (2,971,414 acres) for migratory waterfowl; 45 (85,850 acres) for colonial non-game birds; 16 (10,578,050 acres) for big game; and 25 (3,982,589 acres) for migratory birds other than waterfowl and miscellaneous forms of wildlife. One refuge, the Patuxent Research Refuge, Maryland (2,623 acres), is maintained for wildlife exptl. purposes. The Fish and Wildlife Service conducts the wildlife research and serves in an advisory capacity on the management of wildlife on Indian lands and on national parks, monuments, forests, and grazing districts. On most of these areas wildlife conservation is subordinate to other primary uses of the lands, but on refuges wildlife conservation is of paramount importance. Types of research now in progress on the refuges include studies on refuge management, control of obnoxious vegetation, depredations by waterfowl and its control, harvest of wildlife, restoration of Canada goose nesting in the northern plains states, wildlife diseases (particularly botulism), rare or vanishing species, effects of toxic agents upon wildlife on the habitat, and efficacy of fish and game stocking programs. Some of these topics need more attention than it has been possible to give thus far. Research on our refuges is directed to the discovery of means and methods whereby wildlife may be so managed as to secure the maximum benefits for wildlife and for man.—*Clarence Coltam.*

2755. Dennler de la Tour, J. Parques nacionales y reservas del norte argentino. [National parks and reservations of northern Argentina.] *Rev. Argentina Zoogeogr.* [Buenos Aires] 3(1/2): 33-57. 3 maps, 5 fig. 1943.—Proclaims the need for preserving tracts of land intact with all their flower and animal life in a natural state for the benefit of future generations, this preservation being particularly necessary in the north of Argentina, where there is at present only the National Park of Iguazú. To this end the author visited the Gobernaciones of Misiones, Formosa and Chaco to furnish official information about such lands as are suitable for the creation of other parks and reservations: 1) The Angel Gallardo National Park.—This is situated in the Gobernacion of Chaco, some 100 km. n.-w. of Resistencia, but at present cannot be called a park owing to its layout. Its area of 15,000 hectares is very small, and for that reason it is proposed to add a further 45,000 hectares. The greater part is covered with continuous timber growth and large marshes, having the typical Chaco appearance, damp with alternate clumps of "quebrachos" and palm trees. Mention is made of the flora and of several birds and mammals of the most abundant spp. that need to be protected before it is too late. The author suggests a division of the park into a central wilderness reservation and a buffer area. 2) Iguazú National Park.—Situated in the extreme north of the Gobernacion of Misiones, this park was created with the double purpose of recreation and as a preserve for the animal and plant life of extreme northeast Argentina, but much more attention has been given to the former than to the latter. It has an area of 55,000 hectares and the author proposes its extension even more to the east so that it would be increased to double its present size. He proposes also an inviolate zone, the closing of several roads and the elimination of townships. 3) The Florentino Ameghino National Reservation.—This reservation was proposed in 1936 but has not yet been carried out. The site destined for this park is situated to the south of the Patiño marsh, on the Paraguayan frontier and within the Gobernacion of Formosa. There are at present many towns and villages within its perimeter with all the complications derived therefrom, and therefore immediate control should be taken. The author proposes the creation of an international park between Paraguay and Argentina. 4) The Colonia Tacuari Tourist's Park and Hunting Reservation.—The author proposes the creation of a reservation for touring and hunting, without affording it the category of a park, therefore making it possible to allow a certain exploitation of woods and cattle range. The country selected lies 30 km. south of Resistencia (Gob. of Chaco), on the banks of the Paraná River and has an extension of some 80,000 hectares, much of which is subject to inundation. The vegetation is varied and includes marshes, palms and some woods; its waters are rich in animal life and birds and animals are plentiful. Game abounds and

could be exploited both from a sporting and commercial point of view. The work concludes with a reference to the so-called forest reserves of the territories of northern Argentina, which draws attention to the fact that at present these are being heavily exploited with no attention paid to their reforestation.—*J. A. Crespo.*

2756. Dennler de la Tour, J. Coordinación intersudamericana de las medidas de protección a la fauna. [Inter-South American coordination of the standards for protection of the fauna.] *Rev. Argentina Zoogeogr.* 3(3): 129-133. 1943.—The problems of the S. American fauna are different in many respects from those of N. America. The measures designed to protect some species are not of real value unless put into practice by all the neighboring countries within the range of these spp. Cases are mentioned where such measures have largely failed, especially with mammals and birds occurring in Argentina and neighboring countries. Cooperation among all the countries concerned, so as to arrive at real protection and control, is advocated. The author has already proposed the creation of an Inter-South American Bureau for the protection and conservation of the fauna.—*J. A. Crespo.*

2757. Nicholson, A. J. (U. S. Fish and Wildlife Serv., Billings, Mont.) Conservation of megapods by Solomon Island natives. *Jour. Wildlife Management* 10(4): 366. 1946.—Savo Island natives protect and manage megapods (*Megapodius freycinet eremita*) for their eggs to supplement a scanty diet. This was the only instance of native effort at conservation noted on 8 South Pacific Islands.—*A. J. Nicholson.*

2758. Pfeiffer, E. W., and J. B. Luck. City bred duck hawks. *Nat. Hist.* [New York] 55(7): 338-340. 5 fig. 1946.—The eggs of a pair of duck hawks were frequently washed from the ledge of an office building in Montreal until the authors put a box there which the birds used.—*G. H. Kelker.*

2759. Schoenichen, W. Entwicklungslinien im Schutze belebter Natur. [Lines of development in protection of wildlife.] *Biol. Gen.* [Vienna] 15(1/2): 172-196. 9 fig. 1941.—A review of the development, tasks, and problems of the nature protection movement, chiefly in Germany, emphasizing relations to phytosociology on the one hand, general biology and national economy on the other.—*Max Onno.*

2760. Schoenichen, W. Fragen des kolonialen Naturschutzes. [Problems of colonial nature-protection.] *Biol. Gen.* [Vienna] 16(1/3): 122-148. 1942.—A review of nature protection work done up to the present in extra-European countries, with special regard to Yellowstone and other great national parks, and of the tasks for the future.—*Max Onno.*

2761. Yepes, J. La protección a especies animales de pequeño tamaño. [The protection of minor animal species.] *Rev. Argentina Zoogeogr.* [Buenos Aires] 3(1/2): 59-64. 1943.—Almost all of the treatises on the protection of Argentine animal life cover big game, while the smaller spp., which are also those of less commercial importance, have not been taken into practical account. Nevertheless, these smaller spp. have always some scientific interest, above all because they form part of associations that characterize certain zoogeographical districts. It is also very inconvenient to group under one vernacular name, several very distinct spp., many of which are not found to come within the same protection problem. Such is the case with many rodents and bats. The author insists that the inclusion of certain spp. among those to be protected should always be made on a basis of technical studies of their relation to the animal community of which they form a part, over and above their geographical distribution.—*J. A. Crespo.*

2762. Young, Stanley P. Mountain lion trapping. U. S. Dept. Interior Fish and Wildlife Serv. Circ. 6. 1-7. 4 fig. 1945.—A bulletin of practical instructions.

2763. Anonymous. Sexless pheasants. *All-Pets Mag.* 17(1): 47. 1946. Also in: *South Dakota Conserv. Digest.*—Pheasants of intersexual appearance, in which gonads are absent, have occasionally been found in nature.—*W. F. Hollander.*

2764. Anonymous. Interesting ornamentals [waterfowl]. *All-Pets Mag.* 17(2): 47-48. 1946.—The care and breeding of Mandarin and wood ducks are descr.—*W. F. Hollander.*



# BIOLOGICAL ABSTRACTS

Editor-in-Chief, JOHN E. FLYNN; Associate Editor, JEAN MACCREIGHT

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## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*  
(See also Entries 6616, 6620, 6622, 6704, 6871, 7042)

### PHILOSOPHY OF BIOLOGY

4984. Benjamin, A. Cornelius. (*U. Missouri, Columbia.*) Science and the pursuit of values. *Sci. Month.* 63(4): 305-313. 1946.—Science is not properly distinguished from art, religion, and other human activities as unconcerned with values; it, as much as they, is the pursuit of a certain value, namely, truth. Any conflict between it and others is a conflict of values, subject to rational decision. As a field of education, science is not properly separated from the humanities, though it may be necessary to adjust the presentation of science for the benefit of students interested primarily in man.—*H. F. Copeland.*

4985. Edman, Irwin. (*Columbia U., N. Y. C.*) Science and the dream of happiness. *Amer. Scholar* 15(4): 516-531. 1946.—During several centuries, the pursuit of science has been expected to promote general happiness, whereas in fact it has seemed to yield comforts and gadgets along with the evils of industrial regimentation and of war. The author suggests that all men, including scientists, must for their own protection endeavor to exercise control over the application of scientific discoveries. Meanwhile, it appears that the scientific attitude alone offers the possibility of an adult or rational happiness, through the pursuit of conceivably practical goods as distinguished from baseless dreams.—*H. F. Copeland.*

4986. Gilbert, E. J. *Langage de la science.* [The terminology of science.] 320p. [Published by the author.] Paris, 1945.—This general study undertakes to determine, for the first time, by analysis the logical characters, both fundamental and general, of scientific terminology. It fixes the rules to be followed to eliminate the many errors which occur in all memoirs and scientific books, in favor of the traditional terminology of scholars, whatever language they use. On pp. 179-225 there is an ample original study devoted to the analysis of the particular characteristics of the "Terminology of natural sciences" and to the analysis of "Concepts of species and classification". A species may be thought of under the complementary aspects of a logical class, with a certain sharing of resemblance; and of a type, a logical entity. These 2 aspects are always confused in the mind and terminology of naturalists, as a result of insufficient analysis. This confusion is the cause of such grave errors in terminology that they invalidate the conclusions of the majority of the publications of naturalists. There is no "natural" classification, but an arrangement in order, according to the degree of the logical generality of the correlations between characters. This criticism of systematics is completed by a critical discussion of characters and the correlations of characters. The taxonomic value of a character consists in its frequency and in the correlations involved in it. There are numerous critical remarks on the evolutionary hypothesis.—*E. J. Gilbert (translated).*

4987. Jordan, R. J. Schopenhauer on plant physiology. *S. African Jour. Sci.* 42: 139-141. 1946.—Life is a continuum, and Bose's work on will-full reactions in plants would have appealed to Schopenhauer, who sought in tropisms analogues of the animal will.—*G. W. Sinclair.*

4988. Spiegelman, S. (*Washington U. Sch. Med., St. Louis, Mo.*) The constants in the 'logistic' equation. *Amer. Nat.* 80(788): 186-188. 1946.—An analytic development of the logistic equation is presented from 2 basic bio-

logical assumptions involving the origin of biol. units and competitive interaction for space and substrate. On the basis of this analysis, the origin and the significance of the 3 constants which appear in the final form of the logistic are analyzed. The impossibility of removing any of the 3 constants is demonstrated and the relation between the various differential and integral forms of the logistic employed in the literature is exhibited.—*S. Spiegelman.*

### TAXONOMY AND NOMENCLATURE

4989. Heikertinger, F. Kann Kontinuität der Tiernamen mit der Prioritätsregel erreicht werden? Eine Antwort an Rud. Richter. *Zool. Anz.* 141(1/2): 35-52. 1943—Polemic against the priority rule and answer to Richter [see B.A. 20(4): entry 6129]. If the purpose of the priority rule is to achieve continuity of scientific names, then this is more easily achieved by simply forbidding any changes of names. Under the priority rule there have been vast nos. of name changes with no end in sight; even if stability is eventually achieved, the price is too high. Changes of names can be avoided by applying for a suspension of the priority rule but to do this requires elaborate preparation of references and citations, not practical for many zoologists, and often one must wait years for a decision. A specialist who is more competent than the commission to decide whether a change of name would be more confusing than helpful is asked to hold up his manuscripts until such time as the commission can come to a decision. In fact, every change of name entails more confusion than uniformity. The very existence of the suspension loophole implies that the strict application of the priority rule causes confusion. Zoologists have been accused of indifference with regard to the nomenclatorial rules; but this indifference is accounted for by the great difficulty of finding copies of the rules and of the commission's decisions, the lack of clarity in the rules, and the absence of any guide informing the non-taxonomic zoologist of the most essential points of the rules. German taxonomists were not responsible for the priority rule and have frequently tried to amend it. They started the list of conserved names and in 1913 Brauer proposed that names in use for 50 yrs. prior to 1890 should not be altered and that prior names that had disappeared from the literature for 20 yrs. should not be revived. Although these recommendations were passed they have failed to be incorporated into the rules. The method of selecting members of the commission is criticized and strenuous objection is raised to the fact that the secretary can suppress questions brought up for consideration and can omit presenting them to the commission. The former secretary, Stiles, is accused of having been the chief obstacle to any revision of the priority rule, which he believed should be rigidly applied. The priority rule should be abandoned and replaced by the continuity rule, according to which the accepted name of a genus or species shall be that in current use.—*L. H. Hyman.*

### EXPLORATIONS, EXPEDITIONS, ETC.

4990. Bistrup, H. Oversigt over Meddelelser om Grønland afsluttet i Marts 1941, udgivne af Kommissionen for Videnskabelige Undersøgelser i Grønland. [Account of Meddelelser om Grønland completed in March 1941, issued



by the Commission for Scientific Investigations in Greenland.] 83p. C. A. Reitzels Forlag: København, 1941. Pr. Kr. 4.00.—A chronological table is given of the large and small expeditions, a total of around 180, which have been reported on in the Meddelelser om Grønland. This is followed by alphabetical lists of the leaders and personnel, and a bibliography of the publications issued, arranged by type of subject matter.

4991. Bistrup, H. *Kommissionens Historie, 1878-1943.* [History of the Commission, 1878-1943.] [Eng. summ.] *Meddelelser om Grønland* 134(1): 1-91. 1943.—The appointment of the Commission for the Direction of Geological Investigations in Greenland, in 1878, was due to the initiative of Frederik Johnstrup, professor of mineralogy in the U. of Copenhagen. The main objects were to send out expeditions and arrange voyages of exploration, with publication of the results in *Meddelelser om Grønland*. Later, the Commission acted as adviser and guide for other expeditions to Greenland, both Danish and foreign. The appendix to this paper contains copies of many letters from the archives of the Commission.

4992. Bistrup, H. *Supplement afsluttet den 31. December 1943 til Oversigt over Meddelelser om Grønland afsluttet i Marts 1941, udgivne af Kommissionen for Videnskabelige Undersøgelser i Grønland.* [Supplement completed December 31, 1943 to the account of Meddelelser om Grønland completed in March 1941, issued by the Commission for Scientific Investigations in Greenland.] 32p. C. A. Reitzels Forlag: København, 1945. Pr. Kr. 1.50.—Supplementary lists of expeditions undertaken, of the names of leaders and personnel, and of the publications issued.

#### INSTITUTIONS, ADMINISTRATION

4993. Clepper, Henry. *Running a professional society, or the happy life of an executive secretary.* *Sci. Month.* 63(4): 245-248. 1946.—Author reports that success in his vocation is in proportion to combined excellence in scientific standing, tact, and extrovert disposition.—H. F. Copeland.

4994. Lam, H. J. (*Rijksherbarium, Leiden, Netherlands.*) *The Rijksherbarium during the war.* *Blumea* 5(3): 426-436. 1945.—A brief account of the history of the institution during the war years, its losses, special precautions and measures taken, internal reorganizations undertaken and activities of its staff.—H. J. Lam.

4995. Anonymous. (*U. S. Dept. Agric., Washington,*

D. C.) *Facts about the Food and Agriculture Organization.* *Michigan Publ. Health* 34(10): 198. 1946.—The FAO is an international agency of member countries, at present 42. It was established Oct., 1945, at the Quebec Conference as the first of the permanent United Nations organizations. It has a budget of 5 million a yr. for the first 5 yrs., an annual Conference at which each country has 1 vote, and an Executive Committee of 9-15 members to act for the Conference between sessions. Its purpose is to work jointly to improve: farms, fisheries and forests; the markets where their products are bought and sold; trade in these products among nations; and the health and life of the people concerned. Governments may request FAO to send special missions to study and advise. The 1st FAO mission went to Greece to study the agricultural and fishery problems. FAO acts as a vast clearing house of information, using newspapers, pamphlets, radio broadcasts, etc., and translating, analyzing and interpreting reports from member nations to make them available for other countries. It is an international adviser on food and agriculture.

#### MISCELLANEOUS

4996. Schubart, Otto. *A bacia do rio Branco.* [The valley of the Rio Branco.] *Bol. Min. Agric. [Rio de Janeiro]* 32(6): 33-48. 1943.—The Rio Branco is a coastal river in the State of Sao Paulo and has four tributaries. The plants living in the river and along the banks, the invertebrate fauna, and the fish are listed for each tributary.—D. E. Davis.

4997. Sveistrup, P. P., og Sune Dalgaard. *Det danske Styre af Grønland, 1825-1850.* [The Danish administration of Greenland, 1825-1850.] *Meddelelser om Grønland* 145(1): 1-419. 4 maps, 25 fig. 1945.—A voluminous report, with tables showing population of different settlements, the amounts of the seal catch, and other economic data, at 5-yr. intervals.

4998. Weitzell, E. C. (*U. S. Dept. Agric., Washington, D. C.*) *The Marianas, Caroline, and Marshall Islands.* *Sci. Month.* 63(3): 218-226. 1 fig. 1946.—The bulk of the area and population of these widely scattered small islands is on Saipan, Tinian, Rota, and Guam. The Japanese tried to develop them; the Americans abandoned the Agriculture Experiment Station on Guam after 23 yrs. in 1932. Beyond subsistence for the inhabitants, by agriculture and fishing, all that the islands can be expected to yield are copra and phosphate.—H. F. Copeland.

#### EDUCATION

F. R. KILLE, *Editor*

(See also in the section Apparatus and Technique; Visual Instruction in Microbiology, Immunology and Public Health; and Entries 5208, 7531)

#### GENERAL

4999. Clippinger, Florence E. (*Roosevelt High Sch., Dayton, Ohio.*) *Making nature study a game.* *Amer. Biol. Teacher* 9(1): 12-13. 1 fig. 1946.—An electrical chart has proved valuable in teaching nature study. Different sets of pictures were used at intervals: insects, birds, flowers, fur-bearing animals, and trees. Many students played the game until they knew all 50 organisms. Directions for making the chart are available from National Audubon Society, 1006 Fifth Ave., N. Y. C.—E. T. Cox.

5000. Dexter, Ralph W. (*Kent State U., Ohio.*) *A demonstration of suspended animation.* *Turtlex News* 24(8): 118-119. 1 fig. 1946.—Culturing animal life from dried mud collected in basins of dried pools, lakes, etc. can be used to teach the phenomenon of suspended animation effectively.—R. W. Dexter.

5001. Gerberich, John B. (*Ohio State U., Columbus.*) *Class demonstration of the effects of heavy metals upon bacterial growth.* *Amer. Biol. Teacher* 9(1): 9-12. 1 fig. 1946.—Nutrient agar in Petri dishes and various coins were used in this class demonstration for which detailed directions are given. The agar,  $\frac{1}{4}$  in. deep, was allowed to set (no sterilization is necessary) and 2 different coins impressed on the surface of each and left there. Around every coin except the nickel, a zone of inhibited bacterial growth showed plainly even at 72 hrs. The width of each zone varied with the coin.—E. T. Cox.

5002. Luse, Robert L. *Making field trips worthy.* *Amer. Biol. Teacher* 9(1): 23-24. 1946.—Definite questions stating real problems help set a goal for field trips. What kinds of organisms survive in this location? What conditions keep out other organisms? Why are some more abundant than others? How have the organisms changed the environment? How has man changed the environment and how has this affected other organisms? Is this vacant lot an eyesore, a health problem, or a recreation center? Such questions not only lend a specific goal to the trip but start a student thinking about real community problems.—E. T. Cox.

#### TEXTS

5003. Haupt, Arthur W. (*U. California, Los Angeles.*) *An introduction to botany.* 2nd ed. 425p. Frontispiece, 289 fig. McGraw-Hill: New York, 1946. Pr. \$3.50.—As compared with the former edition, the most outstanding change is the reorganization of the text which has been divided into Part I (13 chapters) dealing with structure and function, and Part II (8 chapters) dealing with the evolution of the plant kingdom. Some new material has been added and certain portions of the text have been rewritten. 20 new illustrations have been added, and 32 of those appearing in the former edition have been replaced with improved ones. Anyone familiar with the first edition will be surprised by the much smaller size of this book, obtained by the use of smaller type, narrower margins, and thinner paper.—P. D. Strausbaugh.

5004. Potter, George Edwin. (*A. and M. Coll., Texas.*) Laboratory manual for introductory zoology. 186p. illus. C. V. Mosby Co.: St. Louis, Mo., 1946.—A laboratory manual for a one-semester course providing exercises on the microscope, the cell, eight invertebrate phyla, amphioxus, frog, cat skeleton, embryology, and histology. Includes 45 outline drawings to be completed by the student, and 81 blank pages for additional records.—*F. R. Kille.*

5005. Sinnott, Edmund W. Botany. Principles and problems. 4th ed. 726p. Frontispiece, 403 fig. McGraw-Hill: New York, 1946. Pr. \$4.50.—The principal changes from earlier editions include a chapter on plant distribution, a new chapter on bryophytes, and a final new chapter on "Botany and the Future." There have been added more than 100 new "Questions for Thought and Discussion", and more than 130 illustrations. Attention is given to the subject matter of recent research, including antibiotics, plant tissue culture, allometric growth, hydroponics, viruses, use of radioactive substances, genetics of *Neurospora*, relation of genetics to evolution, and vitamin physiology. As compared with the 3rd edition, there have been added approx. 200 pages, including an appended list of Greek and Latin roots commonly employed in technical botanical terminology.—*P. D. Strausbaugh.*

5006. Wolcott, Robert H. Animal biology. 2nd ed. 719p. 508 fig. McGraw-Hill Book Co., Inc.: N. Y., 1946. Pr. \$4.—This book covers, along with sufficient examples, all aspects of zoology requisite for an elementary collegiate text of animal biology. In his preface to the original edition the author lists 8 fundamental propositions or planks of the platform on which his textbook rests. Combined, these mean that all living things operate as organized chemico-physical complexes reacting to their specific and total environments. The result is almost infinite diversity and constant change in

the kinds of animals and plants, with consequent adaptation and evolution. The textbook is designed to be used with parallel laboratory course in which the study of types elucidate many of the principles. This edition, while retaining the plan and spirit of its predecessors, has been revised, a memorial to Dr. Wolcott, by his colleagues on the Zoology staff of the Univ. of Nebraska, to include some of the more recent additions and changes in emphasis in animal biology. The more noteworthy of these relate to new knowledge of parasites, heredity, vitamins, hormones and some aspects of human physiology. Some chapters have been added and others particularly those relating to vertebrates, expanded. As over 100 figures have been added, the book is particularly well illustrated. The glossary is unusually full and includes names of some eminent naturalists, pronunciations and in some cases Greek or Latin derivations of technical terms.—*J. P. Moore.*

#### VISUAL INSTRUCTION

5007. Mines, J. L. III. (*Philadelphia Coll. Osteopathic Pa.*) The construction of medical manikins for teaching purposes. *Jour. Amer. Osteopath. Assoc.* 45(6): 247-249, 1946.—Three are described in detail and the needs for all uses of them summarized: (1) mm. of the perineum; (2) perineal orifices and presenting parts, with interchangeable cervixes of various degrees of dilatation, for digital examination; and (3) a pelvis prepared for practice in continuous caudal analgesia. All manikins consist of articulated bones covered with rubber of appropriate type, thickness, color, and arrangement. Pedagogic results with these have been excellent. The manikins seem to be unique.—*W. F. Hewitt, Jr.*

5008. Pijper, A. The film in biology. *S. African Jour. Sci.* 40:1-14. 1943.—A survey of the uses and scope of educational films, and a survey of the resources, esp. in Africa.—*G. W. Sinclair.*

### BIOGRAPHY, HISTORY AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 4987, 4990, 4991, 4992, 4994, 5290, 5686, 6397, 6494, 6622, 6723, 6830, 6872, 6892, 7192, 7279, 7407, 7677, 7809)

#### HISTORY

5009. Ellinger, Tage U. M. Chick embryology at the medical schools of Ancient Greece. *Biol. Bull.* 91(2): 217-218. 1946.—An abstract.

5010. Hedgpeth, Joel W. (*Game Comm., Rockport, Texas.*) The voyage of the Challenger. *Sci. Month.* 63(3): 194-202. 2 fig. 1946.—H. M. S. Challenger explored the oceans from December, 1872, to May, 1876, under advice of the Royal Society, with Wyville Thompson as scientific director, J. Y. Buchanan as chemist and physicist, and H. N. Moseley, Rudolf von Willemoes-Suhm, and John Murray as naturalists. Buchanan showed that the mysterious bathybius, supposedly a forerunner of life, is merely  $\text{CaSO}_4$ . The complete results were published during 19 yrs. in 50 volumes.—*H. F. Copeland.*

5011. Holland, C. W. Origin and early years of the Queensland Naturalists' Club. *Queensland Nat.* 13(2): 26-34. 2 pl. 1946.—The Philosophical Society, founded in Queensland in 1859, was in 1884 merged with the Royal Society of Queensland. The Field Naturalists' Section of the Royal Society, established in 1886, through the enthusiasm of F. M. Bailey, became almost entirely botanical. During the following yrs. the research suffered because of indifference on the part of the government in providing publication funds. In 1892 this society was followed by the Natural History Society of Queensland which, in 1922, became the Queensland Naturalists' Club. S. B. J. Skertchly, Henry Tryon, John Shirley, Rowland Illidge, W. R. Colledge, Cyril T. White, and many others have contributed to the continued success of the Club. "The Queensland Naturalist" was launched in 1908. Field excursions have always been an important part of the activities of the Society, which in July 1921, was amalgamated with the Gould League of Bird Lovers. Conservation of native material is an aim of the organization.—*Ross Hardy.*

#### BIBLIOGRAPHY

5012. Engel, H. Over enkele originele teekeningen,

naar welke houtblokken voor Dodoneus' Cruydtboek gesneden zijn. [Some original drawings after which woodcuts have been made for the "Cruydtboek" of Dodoneus. *Nederland. Kruidk. Arch.* 53: 46-55. 6 fig. 1943.—The author discusses 6 pen- and-ink drawings which were submitted to him by Prof. van Regteren Altena, and of which proved to be the originals of woodcuts which appeared for the first time in the edition of the "Herbarius oft Cruydtboek" of Dodoneus issued in 1608 at Leyden by François van Ravelingen. The drawings are photographically reproduced.—*C. E. B. Bremekamp.*

5013. Utinomi, Huzio. Bibliographia Micronesica scientiae naturalis et cultus. [1-4]. 1-208. Hokuryukan Tokyo. 1944.—The subjects covered are botany, zoology, geology, mineralogy and seismology, limnology, oceanography, geophysics, medicine, anthropology and ethnology, and geography. The entries under each general subject in descriptive biology are arranged under major groups such as Pteridophyta, Bryophyta, Mammalia, Aves, etc. Japanese titles are given in characters but many of them are also translated into English.—*E. D. Merrill.*

5014. Anonymous. Bibliographic index for the study of the natural resources of the Great Asia Co-prosperity Sphere I. *East Indies* 1: [1-4]. 1-689. 1-19. Tokyo, 1944.—Japanese title and text. The subjects covered in this volume are botany, zoology, anthropology and ethnology. There are 3746 author-entries in botany and 5837 in zoology. Under each major subject the entries are arranged by natural group such as Pteridophyta, Lichenes, Mammalia, Insecta, etc., while in anthropology and ethnology there is a partial geographic arrangement. There are no annotations. The last 19 pages consist of abbreviations used for a partial list of periodicals. The region covered is, in general, the Sund Islands, the Philippines, Lesser Sunda Islands, and the Moluccas, but not Papuasia.—*E. D. Merrill.*

#### BIOGRAPHY

5015. André, Marc, et Edouard Lamy. Les carcinolo-

- gistes français du XVIII<sup>e</sup> siècle. *Bull. Mus. Nation. Hist. Nat. [Paris]* 13(2): 73-79. 1941.
5016. Arber, Agnes. Sir Joseph Banks and botany. *Chron. Bot.* 9(2/3): 94-106. 1945.—A biography prep'd. upon the occasion of the bicentenary of his birth, observed in 1943. His life served as a link between persons in the world of science and letters whose lives covered more than the whole range of the 18th and 19th centuries.—E. L. Core.
5017. Auer, Karl. Zum 75. Todestag des grossen Japanforschers Philipp Franz von Siebold. *Oesterreich. Bot. Zeitschr.* 90(4): 308-311. 2 fig. 1941.—A biographical note on Siebold (Würzburg 1796-1866, Munich), an early traveler to Japan, known for his systematic works on the Japanese flora and for many horticultural introductions and studies of drug plants.—Max Onno.
5018. Baer, Jean G. (U. Neuchatel, Switzerland.) Otto Fuhrman [1871-1945]. *Jour. Parasitol.* 32(2): 205-207. Portrait. 1946.—An obituary. Fuhrmann was Professor of Zoology and Comparative Anatomy at the Univ. of Neuchatel, and one of the last great helminthologists of the pioneer generation.
5019. Beltran, Enrique. (U. Mexico.) Lamarck interprete de la naturaleza. [Lamarck, interpreter of nature.] xv+161p. Published by the author: Mexico, D. F., 1945.
5020. Berg, Kaj. Svend Aage Boisen Bennike. 7. December 1918-24. November 1944. *Vidensk. Meddel. Dansk Naturhist. For. Kobenhavn* 108. i-v. Portrait. 1945.—An obituary, with English summary, of a Danish student of the Annelids.
5021. Brook, Charles. Battling surgeon. [With a foreword by Sommerville Hastings.] 176p. Frontispiece. The Strickland Press: Glasgow, Scotland. 1945. Pr. 2 s. 6 d.—The battling surgeon was Thomas Wakley (1795-1862), the founder and first editor of *The Lancet*. Brook has made the biography "unorthodox by interweaving a topical and controversial running commentary" which sometimes obscures the picture of Wakley, who devoted his life to fighting corruption and abuses. *The Lancet* was started as a medium for promulgating the needs of medical reform, nepotism, the inadequacy of the medical colleges, maladministration of hospitals and malpractice. Later when Wakley was elected a M.P., he used his influence and oratory to obtain better education, chances of advancement based on merit rather than on political influence, and recognition of both physicians and surgeons. He made war on quacks, fraudulent drugs and adulterated foods and supported liberal humanitarianism (e.g., the Dorchester laborers' case), and important reforms in the poor laws. He was largely responsible for the abolishment of flogging in the army and navy. He took a position as coroner to place medical evidence on a sound basis. Brook does not give references to his sources but he evidently used the biography by S. Squire Sprigge, *The Life and Times of Thomas Wakley*, Longmans, Green & Co., 1897, and the biography published serially in *The Lancet* (1895-6).
5022. Burke, Joseph F. (New York Bot. Gard.) Robert Hagelstein, May 16, 1870-October 20, 1945. *Amer. Nat.* 80(790): 220-222. 1 photo. 1946.—Robert Hagelstein, Honorary Curator of Myxomycetes, The New York Botanical Garden, a native of New York, died Oct. 20, 1945, at Mineola, N. Y., in his 76th year. A specialist in the myxomycetes and the diatoms, he published his book, "The Mycetozoa of North America, based upon the specimens in The New York Botanical Garden" in 1944. In the "Scientific Survey of Porto Rico and the Virgin Islands," published by the New York Academy of Sciences, he contributed the section on "The Diatomaceae of Porto Rico and the Virgin Islands" which appeared in 1939.—J. F. Burke.
5023. Burkitt, A. N. Obituary. James Thomas Wilson [1861-1945]. *Med. Jour. Australia* 32(26): 512-516. Portrait. 1945.—Biography and appreciation, with bibliography.
5024. Caullery, M. (Fac. Sci., Paris.) Paul Pelseneer, 1863-1945. *Bull. Biol. France et Belgique* 79(1): 1-III. Portrait. 1945.—Obituary notice.
5025. Christie, Jesse R. (U. S. Plant Indust. Sta., Beltsville, Md.) Henry Baldwin Ward (1865-1945). *Jour. Parasitol.* 32(3): 323-324. 1946.—An obituary. Dr. Ward was the founder of the *Journal of Parasitol.* and head of a graduate school of parasitology at the Univ. of Illinois.
5026. Corradetti, A. Camillo Golgi e la sua opera sulla malaria. *Riv. Parasitol.* 4(1): 1-5. Portrait. 1940.—Discusses the work of one of the greatest Italian malariologists of the past.—G. Gramiccia.
5027. Dale, Henry. Address of the President at the Anniversary Meeting, 30 November 1945. *Proc. Roy. Soc. Ser. B: Biol. Sci.* 133(871): 123-139. 1946.—Award of the Copley Medal to Oswald Theodore Avery, a Royal Medal to John Desmond Bernal, a Royal Medal to Edward James Salisbury, the Davy Medal to Roger Adams, the Hughes Medal to B. F. J. Schonland, together with a brief summary of their achievements.—E. H. Shaw, Jr.
5028. Deschiens, R. L'oeuvre médicale exotique de F. Maillot (1804-1894). *Bull. Soc. Path. Exot.* 39(1/2): 10-17. 5 fig. 1946.—Biographical sketch of the man who in 1833 first recommended large doses of quinine for the treatment of malaria.—N. D. Levine.
5029. Dunn, J. Avery. John C. Baker—man and scientist. *Cereal Chem.* 22(6): Suppl. 7-14. Portrait, 2 fig. 1945.—A speech made on the occasion of the banquet and presentation of the Thomas Burr Osborne medal to John C. Baker, at a special meeting of the New York Section of the American Association of Cereal Chemists, May 15, 1945. Dr. Baker's work in cereal chemistry, with many industrial applications, is discussed.
5030. Fernandes, Abilio. Prof. Pierre Allorge (1891-1944). *Bol. Soc. Broteriana* 18 2a Sér.: 551-563. 1 pl. 1944.—Pierre Allorge, Professor of Cryptogams in the National Museum of Natural History, Paris, and one of the most eminent French botanists, died on Jan. 21, 1944. He studied under G. Bonnier and L. Mangin, and published numerous papers on algae, bryophytes, and phytogeography, dating from 1915 to 1942, from his studies in France, Spain, Portugal, the Azores, and the Antilles. An account of his career and a list of his publications are included in the notice; also a portrait.—J. L. Cartledge.
5031. Grøntved, Johs. Jens Johannes Sørensen Grandrup, October 28, 1882-October 14, 1943. *Bot. Tidsskr.* 46(3): 290-293. Portrait. 1944.—An obituary.
5032. Gauducheau, M. F. Lestogard (1897-1940). *Bull. Soc. Path. Exot.* 33(6/10): 403-404. 1940.—A necrology.
5033. Gauducheau, A. Antoine Lasnet (1870-1940). *Bull. Soc. Path. Exot.* 34(1/3): 2-4. 1941.—A necrology.
5034. Gibson, Arthur. Obituary. Clarence B. Hutchings, 1877-1945. *Canadian Ent.* 77(12): 235-236. 1945.
5035. Gibson, Arthur. Obituary. Theodore Henry Friess, 1895-1945. *Canadian Ent.* 78(1): 23-24. 1946.
5036. Green, Wyman R. (Drew U., Madison, N. J.) Clarence Erwin McClung—His friendship and contributions to knowledge. *Bios* 17(2): 74-83. Portrait. 1946.—An appreciation of his life and work. "His position in the zoological world rests on researches of the highest order in the field of cytology . . . he has endeavored to inculcate habits of exactitude in the use of terminology."—L. J. Gier.
5037. Hardy, A. C. Stanley Wells Kemp, 1882-1945. *Jour. Marine Biol. Assoc. United Kingdom* 26(3): 219-234. Portrait. 1946.—An appreciation and review of the work of the Director of the Plymouth Laboratory, the organizer and director of the "Discovery" Investigations. The paper includes a record of the events during the blitz of Plymouth, when Dr. Kemp's home was burned while he worked to save the Laboratory.
5038. Howard, Hildegarde. George Willett: May 28, 1879-August 2, 1945. *Condor* 48(2): 49-71. Portrait, 11 fig. 1946.—An obituary and biography of this ornithologist, with a list of the animals named for him, and a bibliography of his works.
5039. Hsü, H. F. Candido M. Africa (1894-1945). *Jour. Parasitol.* 32(4): 431-432. Portrait. 1946.—Obituary notes on Doctor Candido M. Africa, of heterophyidiasis fame who was killed on Feb. 12, 1945, during the Battle of Manila.—H. F. Hsü.
5040. Hubbs, Carl L. (Scripps Inst. Oceanogr., La Jolla, Calif.) Francis B. Sumner, 1874-1945. *Copeia* 1945(4): 183-184. Portrait. 1946.—Obituary notice.
5041. Hutchinson, G. Evelyn. (Yale U.) Alexander Petrunkevitch. An appreciation of his scientific works and a list of his published writings. *Trans. Connecticut Acad. Arts and Sci.* 36: 9-24. 1945.—Notes on Petrunkevitch's life and major scientific works with bibliography of all his writings



up to 1943 and list of theses done under his direction.—G. E. Hutchinson.

5042. Jacobsen, Borge. Professor, Dr. Phil. C. Ferdinandsen, 18. Februar 1879-28. Marts 1944. *Ugeskrift for Landmoend* 89: 217-220. Portrait. 1944.—An obituary and review [all in Danish] of the life and work of this Danish plant pathologist.

5043. Jansen, P., en W. H. Wachter. In memoriam Johannes Cornelis Schoute. *Nederland Kruidk. Arch.* 52: 1-6. Portrait. 1942.

5044. Jansen, P., en W. H. Wachter. Personalialia. III. *Nederland Kruidk. Arch.* 51: 340-379. 1941.—Biographical notes on a large number of Dutch botanists and of persons who in some way contributed to the advancement of botany in the Netherlands.—C. E. B. Bremekamp.

5045. Jansen, P., W. H. Wachter, en H. Engel. Personalialia. IV. *Nederland Kruidk. Arch.* 52: 371-415. 1942.—Continuation of the biographical notes on Dutch biologists and persons who in some way are connected with biology or the biologists.—C. E. B. Bremekamp.

5046. Jansen, P., W. H. Wachter, en H. Engel. Personalialia. V. *Nederland Kruidk. Arch.* 53: 232-257. 1943.—Continuation of this list of biographical notes on Dutch biologists.—C. E. B. Bremekamp.

5047. Jansen, P., en W. H. Wachter. In memoriam Benedictus Hubertus Danser. *Nederland Kruidk. Arch.* 53: 129-136. Portrait. 1943.

5048. Jeannel, R. Eugène-Louis Bouvier (1856-1944). *Ann. Soc. ent. France* 113: 1-30. 1 pl. 1946.—Biography. List of publications (422 numbers).—R. Paulian.

5049. Koster, Jos. Th. Notice sur Madame Dr. A. A. Weber née van Bosse à l'occasion de son 90ième anniversaire. [The 90th birthday of Dr. A. A. Weber.] *Blumea Suppl.* 2: 3-9. 1942.—A "curriculum vitae" that appeared to be almost a necrology, for it was published on the 17th of Mar., 1942 and on the 29th of October, 1942, Dr. A. A. Weber-van Bosse died. A list of her publications is added, together with a list of the botanical and zoological names of genera and spp. named after her up to the time of publication.—J. T. Koster.

5050. Löhns, M. P. Professor Dr. Johanna Westerdijk 1917-1942. *Antonie van Leeuwenhoek, Jour. Microbiol. and Serol.* 8(1): 1-9. Portrait. 1942.—Biography.

5051. Merrill, E. D. (Arnold Arboretum, Jamaica Plain, Mass.) Dr. Thomas Barbour. *Amer. Nat.* 80(790): 214-216. Portrait. 1946.—A brief biographic sketch, covering some of the salient features of Dr. Barbour's career (Aug. 19, 1884-Jan. 8, 1946).—E. D. Merrill.

5052. Missiroli, A. Ettore Marchiafava. *Riv. Parasitol.* 5(1): 1-4. Portrait. 1941.—A brief biography of E. Marchiafava (1847-1935), with a discussion of the researches of this pioneer Italian malarialogist.—G. Gramiccia.

5053. Morales Macedo, Carlos. (Mus. Hist. Nat. "Javier Prado", Lima, Peru.) Dr. Fortunato L. Herrera. *Bol. Mus. Hist. Nat. "Javier Prado"* 9(1/2): 164-167. 1945.—This distinguished Peruvian botanist (1873-1945) published 121 papers and had 42 spp. of plants named for him.—W. C. Tobie.

5054. Moss, E. A. (U. Alberta, Canada.) Alfred Henry Brinkman (1873-1945). *Bryologist* 49(1): 1-3. 1946.—A brief account of Brinkman's life and botanical work together with a list of his publications.—P. M. Patterson.

5055. Mukerji, B. (U. Calcutta, India.) Sir Upendranath Brahmachari (1873-1946). Obituary. *Calcutta Med. Jour.* 43(2): 39-43. Portrait. 1946.—Brahmachari is best known for his discovery of urea stibamine, a specific for kala-azar (visceral leishmaniasis) which has saved millions of lives. In 1938 he synthesized an antimalarial compd. which proved to be atabrin and was responsible for the commercial prepn. of the drug in India. His chief interest was chemotherapy but he was a "superb clinician and a magnetic teacher." Since he received all his education in India and never left the country for study he has been an inspiration to Indian students, showing them what can be accomplished without going to a foreign university. He received his first medical degree from Calcutta Med. Coll. and later taught there and at Campbell Med. Sch., Carmichael Med. Coll. and Calcutta U. He was an early editor of the *Calcutta Med. Jour.* and published several books on kala-azar and wrote on other subjects.

5056. Mullett, Charles F. (U. Missouri, Columbia.) John Cook, M.D., physician-at-large. *Bull. History Med.* 19(5): 498-516. 1946.—John Cook (d. 1777) was a writer of medical books (1730-1770) and of articles in popular magazines from 1726 to some posthumous articles printed as late as 1781. He and his opinions are here resolved as typifying a large section of 18th century theory and practice of medicine.—R. P. Bigelow.

5057. Petersen J. Boye. Carl Frederik Albert Christensen, November 24, 1942. *Bot. Tidsskr.* 46(2): 177-179. 1942.—Obituary.

5058. Pollacci, G. (U. Pavia, Italy.) Vallisneri Antonio di Lorenzo. *Atti Ist. Bot. "Giovanni Briosi" e Lab. Crittogamico Ital. Univ. Pavia Ser.* 4 11: iii-iv. Portrait. 1939.—Antonio Vallisneri (1661-1730), an early Italian naturalist of note, who taught and practiced medicine at Modena, Italy, was interested in both zoology and botany. *Vallisneria* of the Hydrocharitaceae was named in his honor.—E. K. Cash.

5059. Pollacci, Gino. (U. Pavia, Italy.) Achille Forti (1878-1937). *Atti Ist. Bot. "Giovanni Briosi" e Lab. Crittogamico Ital. Univ. Pavia Ser.* 4 10: iii-xvi. Portrait. 1938.—Forti became interested in algae as a pupil of P. A. Saccardo at the Univ. of Padua. He made extensive collections in Europe, N. Africa, and Asia Minor, and specimens were sent to him for determination from all parts of the world. 195 publications on algology and other branches of botany and miscellaneous articles are listed.—E. K. Cash.

5060. Pollacci, Gino. (U. Pavia, Italy.) Augusto Béguinot. *Atti Ist. Bot. "Giovanni Briosi" e Lab. Crittogamico Ital. Univ. Pavia, Ser.* 4 12: iii-xvi. 1940.—Brief sketch of life of the Italian botanist A. Béguinot (1871-1940) with 13 pp. bibliography of his publications in the fields of ecology, genetics, systematic botany, and miscellaneous.—E. K. Cash.

5061. Pollacci, Gino. (U. Pavia, Italy.) Emilio Chiovenda. *Atti Ist. Bot. "Giovanni Briosi" e Lab. Crittogamico Ital. Univ. Pavia Ser.* 4 13: [1.] Portrait. 1941.—Portrait of systematic botanist E. Chiovenda (1871-1941).

5062. R. A. K. The late J. A. Kershaw. *Victorian Nat.* 62(12): 243-244. 1946.—Feb. 16, 1946, marks the passing of a pioneer scientist of Victoria. He was chiefly an entomologist but his publications cover a variety of zoological subjects. He served as an assistant to the National Museum and the Director until his retirement in 1931. He received many scientific honors and took prominent part in preservation of fauna and flora.—Olga Lakela.

5063. Reed, Howard S. (U. California, Berkeley.) A trio of biologists from Erie County [Pennsylvania]. *Western Pennsylvania Historical Mag.* 28: 147-152. 1945.—Ernest Ingersoll, born 1852, was a naturalist and collector who wrote many books on natural history in the period 1881-1920. Milton Jay Greenman (1866-1937) was an anatomist and director of Wistar Inst. of Anatomy and Biology in Philadelphia. Jesse More Greenman, born 1867, was a botanist and curator of the herbarium of the Missouri Bot. Gard.

5064. Roberts, John W. Merton Benway Waite, 1865-1945. *Phytopath.* 36(3): 175-179. Portrait. 1946.—An obituary and review of the life and work of this pioneer in fruit disease investigation. The bibliography lists 74 publications.

5065. Rose, G. (R. Koch Inst., Berlin.) Robert Kochs tropenmedizinisches Werk. *Deutsch. tropenmed. Zeitschr.* 47(23/24): 601-613. 1943.—Emphasizes and commemorates the work of Koch on tropical diseases which made him the first German authority in the field.—Theodor von Brand.

5066. Roubaud, E. Alphonse Laveran, l'homme et le savant. *Quelques souvenirs. Bull. Soc. Path. Exot.* 39 (1/2): 3-10. 1946.—Biographical notes.

5067. Ruys, A. Charlotte. Prof. Dr. J. J. M. van Loghem, 1916-1941. *Antonie van Leeuwenhoek, Jour. Microbiol. and Serol.* 7(4): 189-197. Portrait. 1941.

5068. Ruys, A. Charlotte. Bibliography Prof. Dr. J. J. M. van Loghem, 1903-1941. *Antonie van Leeuwenhoek, Jour. Microbiol. and Serol.* 7(4): 198-210. 1941.

5069. Sarkar, S. S. Obituary: Thomas Hunt Morgan (1866-1945). *Sci. and Culture* 11(11): 407-408. 1946.

5070. Shoup, C. S. (Vanderbilt U., Nashville, Tenn.) Dr. George R. Gage, 1890-1945. *Jour. Tennessee Acad. Sci.* 21(2): 187-188. 1 fig. 1946.—A biographical sketch

of Dr. Gage, who was Professor of Botany at Vanderbilt Univ. at the time of his death.—*J. M. Shaver.*

5071. Shull, Charles A. (42 Oakwood St., Asheville, N. C.) Rodney Beecher Harvey. *Amer. Nat.* 80(790): 217-220. Portrait. 1946.—A biographical sketch, and an appreciation of the work of Dr. Rodney Beecher Harvey on the occasion of his death.—*C. A. Shull.*

5072. Sirks, M. J. (*U. Groningen, Netherlands.*) Rumphius, the blind seer of Amboina, transl. by Lily M. Perry. (*Arnold Arboretum, Harvard U.*). In: *Science and Scientists in the Netherlands Indies* 295-307. 3 fig. Chronica Botanica Co.: Waltham, Mass., 1945.—Based on Chapter II (G. E. Rumphius) from the author's "Indisch Natuuronderzoek" (Thesis, Amsterdam, 1915).

5073. Stevenson, John A. James Robert Weir, 1881-1943. *Phytopath.* 36(7): 487-492. Portrait. 1946.—An obituary, and review of the work of this plant pathologist, with bibliography. Dr. Weir was particularly active in recent years in rubber research, being responsible for bringing to Brazil from the East Indies plants from selected clones of *Hevea*, which formed the basis of subsequent large-scale field plantings.

5074. Tharp, B. C., and Fred A. Barkley. (*U. Texas, Austin.*) University of Texas Herbarium Biographical Sketch. VIII. *Bull. Torrey Bot. Club* 73(2): 131. 1946.—The biography of Mary Sophie Young (1872-1919) is given.—*F. A. Barkley.*

5075. Tharp, B. C., and Fred A. Barkley. (*U. Texas, Austin.*) University of Texas Herbarium Biographical Sketch. IX. *Bull. Torrey Bot. Club* 73(2): 133. 1946.—The biography of Thelma Ratcliffe Walker (1908—) is given.—*F. A. Barkley.*

5076. Tiffany, Selman A. Albert Edward Edgecombe, 1897-1945. *Phytopath.* 36(5): 327-328. Portrait. 1946.—An obituary and appreciation. Professor Edgecombe's research activities were largely in the field of mycology.

5077. Truog, Emil. Andrew Robeson Whitson, 1870-1945. *Soil Sci.* 61(4): 273-274. Portrait. 1946.—An obituary, with review of the work of this head of the soils work at the Univ. of Wisconsin.

5078. Waksman, Selman A. (*New Jersey Agric. Expt. Sta., New Brunswick.*) Sergei Nikolaevitch Winogradsky. September 1, 1856-August 31, 1946. The story of a great bacteriologist. *Soil Sci.* 62(3): 197-226. Portrait. 1946.—This is not an obituary, but a tribute published to commemorate the 90th anniversary of the birth of Dr. Winogradsky, who has for many yrs. been a consulting editor of *Soil Science*. His working life is divided into 6 periods, before his retirement in 1940. The events of his life and the problems he investigated during each period are discussed in considerable detail. Winogradsky is responsible for fundamental work on the iron bacteria and the nitrifying bacteria. A bibliography of 58 titles is included.

5079. Walker, J. C. James Peter Jolivet, 1915-1945. *Phytopath.* 36(6): 415-417. Portrait. 1946.—An obituary and appreciation. This promising young investigator of vegetable deficiency diseases was killed in the Philippines.

5080. Weiss, Harry B. Fred M. Schott, 1887-1946. *Jour. New York Ent. Soc.* 54(2): 170-171. 1946.—Obituary.

5081. Wenrich, D. H. (*U. Pennsylvania, Philadelphia.*)

Clarence Erwin McClung. *Amer. Nat.* 80(791): 294-296. Portrait. 1946.—The former head of the department of zoology at the Univ. of Kansas, 1901-1912, and Director of the zoological laboratory at the Univ. of Pennsylvania, 1912-1940, who first recognized the chromosomal mechanism for the determination of sex, and who engaged in many activities for the advancement of science, including the promotion of *Biological Abstracts*, died suddenly, Jan. 17, 1946.—*D. H. Wenrich.*

5082. Wheeler, Carl O. J. Homer Jay Wheeler. *Jour. Assoc. Offic. Agric. Chem.* 29(2): VII-VIII. 1 fig. 1946.—A short account of his life, his works and the positions he held; chiefly with the Rhode Island Expt. Station and then later—after 1912—with the American Agric. Chemical Co.—*J. E. Webster.*

5083. Wilson, J. Walter. (*Brown U., Providence, R. I.*) Valediction. Arthur Mangun Banta. *Sci. Month.* 62(4): 391-393. 1 fig. 1946.—Died January 2, 1946, aged 68. Ph.D. Harvard 1907, a student of evolution and genetics, particularly of adaptations to life in darkness; at Brown Univ. from 1929, Emeritus 1945.—*H. F. Copeland.*

5084. Winge, Ø. Professor Carl Ferdinandsen. February 18, 1879-March 28, 1944. *Bot. Tidsskr.* 46(3): 286-290. Portrait. 1944.—An obituary.

5085. Woodruff, Lorange Loss. (*Yale U.*) Alexander Petrunkevitch, colleague and friend. *Trans. Connecticut Acad. Arts and Sci.* 36: 7-8. 1945.—Biographical.

5086. Wright, Clarence W. (*Livingstone Coll., Salisbury, N. C.*) George Washington Carver, an American scientist. *Jour. Chem. Educ.* 23(6): 268-270. 1946.—A biographical sketch.

5087. Wyman, D. William H. Judd, propagator. *Arnoldia* 6(6): 25-28. 1946.—William H. Judd spent 33 yrs. propagating plants in the Arnold Arboretum and died suddenly on May 23, 1946. This number of *Arnoldia* gives his outstanding accomplishment in some detail.—*D. Wyman.*

5088. Anonymous. Fred M. Smith, 1888-1946. *Amer. Heart Jour.* 31(3): 253. 1946.

5089. Anonymous. Alipio de Miranda Ribeiro [1874-1939]. *Arq. Mus. Nacion. Rio de Janeiro* 37: 11-19. Portrait. 1943.—A review of the life and work of this Brazilian naturalist, with bibliography.

5090. Anonymous. In memoriam: Upendranath Brahmachari. *Sci. and Culture* 11(9): 447-450. 1 fig. 1946.—Sir Upendranath Brahmachari, (b. Dec. 19, 1873, d. Feb. 6, 1946), discovered urea stibamine, studied tropical diseases like kala-azar, malaria, black water fever, etc., founded the Brahmachari Research Inst., was a professor as well as a practicing physician and did a great deal toward improving the treatment of tropical diseases. He occupied a distinguished place in Indian medicine and education.—*M. D. Rogick.*

5091. Anonymous. Gottlieb Haberlandt, 1854-1945. *Sci. and Culture* 11(10): 539-541. 1946.—Gottlieb Haberlandt, b. Nov. 28, 1854, at Hungarian Altenburg, was a noted plant physiologist and anatomist. He possessed talent for drawing, music and organization. A good deal of his time as a scientist was spent at Graz and in the later part of his life at Berlin. His travels took him to Java, Ceylon, Singapore and Egypt. He wrote numerous treatises and books. He died in Oct. 1945.—*M. D. Rogick.*

## EVOLUTION

ALFRED EMERSON, *Editor*

(See also: Influence of nutrition on production of mutants in plants, 5163; Evolution of fungivorous habit, insects, 5298; Phylogeny of Bryozoa, 7559; Interzoidal communications in Bryozoa, 7560; Adaptive behavior in Paguridae, 7595; Nests of termites, 7777)

5092. Goldschmidt, Richard B. (*U. California, Berkeley.*) "An empirical evolutionary generalization" viewed from the standpoint of phenogenetics. *Amer. Nat.* 80(192): 305-317. 1946.—The paper discusses what G. G. Simpson has called an empirical evolutionary generalization, namely, an enhanced inter- and intra-individual variability of organs facing rudimentation. Comparable phenotypic features encountered in *Drosophila* mutants of low penetrance are discussed in terms of development involving time relations, points of determination, thresholds, and similar conceptions

of physiological genetics. It is shown that simple mutants acting in a definite developmental system may account for the facts under discussion as well as for comparable ones of progressive evolution. The author warns against studying evolution exclusively from the standpoint of static genetics.—*R. B. Goldschmidt.*

5093. Herre, W. Zur Frage der Kausalität von Domestikationserscheinungen. Von den Ergebnissen einer Erkundungsfahrt der Forschungsgruppe Schulz-Kampfenkel E. V. *Zool. Anz.* 141(9/10): 196-214. 15 fig. 1943.—To investi-

gate domestication changes, an animal recently domesticated and living under conditions similar to those of the wild form was sought, and the reindeer was selected. The study was conducted in Lapland. The domestic reindeer is not fed but finds its own forage and, as it is customary to assemble them in herds, the forage may be insufficient and result in smaller size than in the wild form that is solitary or forms small groups for breeding. A selective effect may result from the practice of castrating ♂♂ older than 4 yrs. These young ♂♂ fight less over ♀♀ than older ♂♂ so that there is less selection under domestication of the most vigorous ♂♂, and further in the herds weaker ♂♂ have more chance to copulate than in the wild. Further the herdsmen interfere with natural selection by finding feeding grounds, protecting the herd from enemies, rescuing weak calves, etc. The effects of domestication noted were: greater color variation, including spotting, great variation in limb length, change of eye color, disproportions of limbs and body. Often up to 50% of domesticated herds differed in appearance from the wild type. The changes appear to result not so much from the conditions of domestication as from the interference with natural selection.—*L. H. Hyman.*

5094. Novikoff, M. Über den Bau der Sehorgane als Ausdruck einer morphologischen Gesetzmässigkeit. [Structure of visual organs as an expression of morphological regularity.] *Biol. Gen. [Vienna]* 6(1/3): 113-121. 2 fig. 1942.—The author shows that perfection of visual organs (eyes) within the animal kingdom was attained by 3 ways, which are properly those of the evolutionary process, viz., complication, differentiation, and localization (or concentration).—*Max Onno.*

5095. Steinbacher, Georg, und Joachim Steinbacher.

Über die Entstehung und das Alter von Vogelrassen. *Zool. Anz.* 141(7/8): 141-147. 1 fig. 1943.—There has been wide acceptance of Stressemann's theory that many races of birds arose through the separation of middle Europe through glacia into 2 areas by means of ice wastes and tundras. Such bird races would therefore be at least 20,000 yrs. old. The authors point out that the maps of the last glacial period show no such separation of middle Europe into 2 areas but a continuous birch-evergreen forest from western Europe to Asia Minor along the southern part of Europe. The races of birds appear rather to be associated with vegetation and this in turn is related to climate. The separation of the British Isles from the European continent altered the climate of western Europe and of Britain and thereby the vegetation and these changes are the probable cause of the numerous endemic races of birds in Britain. Such races are therefore only a few thousand years old. Many, if not all, bird races in Europe are much younger than usually supposed.—*L. H. Hyman.*

5096. Timoféeff-Ressovsky, N. W. Sulla questione dell'isolamento biologico entro popolazioni specifiche. [On the problem of biological isolation within specific populations.] *Scientia Genetica [Torino]* 1(4): 317-325. 1940.—By "biological isolation" are meant those cases where a partial or total limitation to random breeding takes place, without the presence of any "mechanical", i.e., territorial, separation. The possible types of biological isolation are genetic, sexual physiologic and ecologic. A large number of data are presented, taken from expts. on selective matings between different geographical strains of *Drosophila funebris*, and between different mutants of the same species. Data of other authors are taken into account.—*A. Buzzati-Traverso.*

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 5145, 5149, 5152, 5161, 5162, 5163, 5167, 5177, 5180, 5350, 5380, 5447, 5615, 5840, 5841, 5872, 6131, 6908, 7210, 7216)

### GENERAL

5097. Engström, A. (*Karolinischen Inst., Stockholm, Sweden.*) Korrelation zwischen Aschengehalt und Ultraviolettabsorption bei verschiedenen Zellbestandteilen. [Correlation between ash content and u.-v. absorption in various cell components. *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(5): 459-472. 18 fig. 1943.—Sections of various tissues were photographed in u.-v. light of 2570 Å wavelength and then microincinerated. It was found that the ash is chiefly condensed within the components of the nucleus and the cytoplasm which strongly absorb this ultraviolet light. The same light is strongly absorbed also by nucleotides. Therefore it must be assumed that the nucleotides contain large amounts of ash producing substances.—*Ludwik Monné.*

5098. Youssef, S. D. (*Fac. Pharm., Strasbourg, France.*) Contribution à l'étude de la colchicine et de la ricine. 77p. 11 fig. Thesis: Clermont Ferrand, France. 1941.—The effects of colchicine and ricine are reviewed as they have been studied in the fields of teratology, pharmacology, toxicology and cytology. In a comparison of the effects of colchicine and ricine, the author concludes his own studies. Sublethal doses of colchicine and ricine, in the 48-hr. chick embryo, produced the same cytological and morphological anomalies. Onion roots showed swellings and less elongation in colchicine, ricine, and chloral hydrate but in 1:500 ricine, mitoses remained normal.—*Ivor Cornman.*

5099. Zittle, Charles A. (*Biochem. Res. Found., Newark, Del.*) Alkaline hydrolysis of and effect of heat on ribonucleic acid. *Jour. Franklin Inst.* 242(3): 221-227. 3 fig. 1946.—Samples of ribonucleic acid exposed to oven heat of 64-184°C for 16 hrs. were measurably less affected by NaOH than before. This observation may explain variations in hydrolyzability from 1 lot to another. A sample was found to be less sensitive to alkali after 3 months' exposure to summer temps., though it had been stored without change for a considerable period. The treatment was shown to reduce the molecular size without altering the charge on the molecule, and it was inferred that the ribose fraction was the portion damaged. The hydrolysis was shown to be critically affected by pH,

and the fact that acid radicals are released during the heat changes may account for the decreased sensitivity. The suitability of ribonucleic acid as a substrate for enzymes from calf mucosa was not altered by the exposure to heat, though higher temps. had some effect on this type of hydrolysis as well.—*R. K. Jennings.*

### PLANT

5100. Berger, C. A. Naturally occurring polyploidy in the development of *Allium cepa* L. *Biol. Bull.* 91(2): 217. 1946.—An abstract.

5101. Boivin, André, et Roger Vendrely. (*Inst. Pasteur, Paris.*) Rôle de l'acide désoxy-ribonucléique hautement polymérisé dans le déterminisme des caractères héréditaires des bactéries. Signification pour la biochimie générale de l'hérédité. [The role of highly polymerized deoxy-ribonucleic acid in the determination of the hereditary characters of bacteria. Significance for the general biochemistry of heredity.] *Helvetica Chim. Acta* 29(5): 1338-1344. 1946.—Desoxyribosenucleic acid appears to be the substance responsible for the production of some types of variants in bacterial cultures. The possible application to the general problem of heredity is discussed.—*F. A. McDermott.*

5102. De Vos, Miriam P. (*U. Stellenbosch, S. Africa.*) Cytological studies in genera of the Proteaceae. *S. African Jour. Sci.* 40: 113-122. 1943.—Spp. of *Protea*, *Leucospermum*, *Mimetes*, *Paranomus*, *Serruria*, *Aulax* and *Brabejum* were studied. The basic chromosome number is probably 12, but some genera are aneuploid with nos. 11-14. No polyploids were found. Chromosomes in meiosis are very small, almost uniform in size and subcircular; some show terminalization. Chromosomes in mitotic divisions are rod-shaped, and in some genera vary in size and position of the centromere.—*G. W. Sinclair.*

5103. Dodson, E. O. (*U. California, Berkeley.*) Some evidence for the specificity of the Feulgen reaction. *Stain Technol.* 21(3): 103-105. 1946.—Tests were made to refute the objections of Carr against the specificity of the Feulgen reaction. The contention that the chromosomes are adsorbents capable of regenerating the color of the Schiff reagent



was tested by staining chromosomes treated with nuclease. These were Feulgen negative although their protein base remained intact. The contention that selective affinity of the nucleus for the stain is due to destruction of cytoplasm by the acid hydrolysis was tested by hydrolyzing rat liver fixed in Borin, washing off solute, drying and comparing wt. loss with controls. The differences in wt. were negligible, showing that the fixed cytoplasm had not been rendered soluble by the hydrolysis. It was concluded that Carr's objections are not valid.—*E. R. Noble.*

5104. Geitler, Lothar. (*Kaiser Wilhelm Inst., Vienna.*) Über eine postmeiotische Teilungsanomalie und den Spiralbau der Chromosomen von *Paris quadrifolia*. [Postmeiotic division anomalies and the spiral structure of the chromosomes of *P. quadrifolia*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(5): 519-530. 19 fig. 1943.—In 3 plants of *P. quadrifolia* an abnormal postmeiotic mitosis was observed. Spindles and metaphase chromosomes were formed, but the cells did not divide. The metaphase chromosomes, which showed no longitudinal split, were directly transformed into telophase chromosomes and resting nuclei. Division of the chromosomes and the anaphase failed to occur. Observations on the spiral structure of the chromosomes are reported. Under the influence of  $\text{NH}_3$ -alcohol, a double spiral—not 2 separated spirals—may appear in any chromatid.—*Ludwik Monné.*

5105. Geitler, Lothar. (*Kaiser Wilhelm Inst., Vienna.*) Der Bau der Riesenkerne der Elaiosoms von *Corydalis cava*. [Structure of the giant nuclei of the elaiosoms of *C. cava*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(6): 544-548. 6 fig. 1944.—The growth of the elaiosome is due to cell growth without cell proliferation. During the development of the elaiosomes the volume of the nuclei may increase 400 times. The euchromatin and heterochromatin were investigated and it was found that the nuclei are highly polyploid.—*Ludwik Monné.*

5106. Goodspeed, T. H. Meiotic prophase phenomena in species and interspecific hybrids of *Nicotiana*. *Jour. Arnold Arboretum* 27(4): 453-469. 3 pl., 1 fig. 1946.—Earlier studies have shown that the degree of chromosome pairing in  $F_1$  species hybrids is closely correlated with the degree of genetic relationship of the parental species. To be sure that failure of meiotic pairing was not due to genetically controlled desynapsis, the prophase association of meiotic chromosomes was studied in the various *Nicotiana* species hybrids. The degree of prophase association is closely correlated with the degree of chromosome association at meiotic metaphase.—*Karl Sax.*

5107. Grafi, Ina. Über das Wachstum der Antipodenkerne. [The growth of the antipodal nuclei.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(1): 1-11. 15 fig. 1941.—The nuclei of the antipodal cells of *Calia palustris* undergo mitotic division before the polar nuclei fuse. Binucleate cells are formed, and chromosomes and spindles appear synchronously in both nuclei. The 2 spindles fuse. One spindle with the double chromosome number is formed, and division takes place. Later the nuclei become tetraploid and octoploid in exactly the same way. Abnormalities may occur.—*Ludwik Monné.*

5108. Gustafsson, Åke. Meiosis und Mitosis. Eine Erklärung der meiotischen Erscheinungen bei *Hieracium*. [Meiosis and mitosis, an explanation of the meiotic phenomena in *Hieracium*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(4): 367-387. 12 fig. 1942.—The disturbed meiosis occurring in *Hieracium* were investigated and the differences between mitotic and meiotic phenomena are described. In *H. amplexicaule* and *H. robustum*, 10 forms of disturbed meiotic divisions may occur. There are also various intermediate forms between mitosis and meiosis. The prophase of meiosis is prolonged; that of mitosis is brief. This is the most important difference between meiosis and mitosis. Meiosis is induced by agents which prolong the prophase; mitosis, by agents which shorten the prophase.—*Ludwik Monné.*

5109. Hurcombe, Ruth. (*U. Witwatersrand, Johannesburg, S. Africa.*) Chromosome studies in *Cynodon*. *S. African Jour. Sci.* 42: 144-146. 1946.—Chromosome no.

in *C. bradleyi* is 9 (gametic) and 18 (somatic). Shape and thickness of chromosomes varied with staining techniques.—*G. W. Sinclair.*

5110. Newcomer, Earl H. (*U. N. Carolina, Chapel Hill.*) Concerning the duality of mitochondria and the validity of the osmiophilic platelets in plants. *Amer. Jour. Bot.* 33(8): 684-697. 41 fig. 1946.—The results of this study show that there are no distinctions in morphology, structure, chemistry, function, staining behavior, or behavior during mitosis in plant mitochondria whereby one can separate them into separate, genetically unrelated categories of organelles. The two specific theories of the duality of the mitochondria in plants advanced by Guiliemond and Bowen, respectively, are shown to be invalid. The results of this study and the literature on the subject suggest that the functions of mitochondria are multiple, variable or perhaps eclectic in nature, subject to the genetic and metabolic requirements of the organism. The osmiophilic platelets are not cell organs sui generis, but artifacts of a deformed mitochondrion produced by capricious technics. The heretofore mutually exclusive acid and basic fixation images have been combined to achieve complete fixation. Suggestions for the correction and simplification of the terminology on mitochondria in plants are made: (1) the term mitochondria ("mitos", thread—"chondrion", small grain), coined by Benda in 1897, should be retained on grounds of etymology, priority and common usage; (2) the term mitosome should be used logically for the elongated or thread-like mitochondria, and the term chondriosome should be used for the granular mitochondria; (3) the term mitochondrion should be used in a collective sense in reference to all the mitochondria of a cell or tissue.—*Earl H. Newcomer.*

5111. Pfeiffer, Hans H. Polarisationsmikroskopische Dehnungs- und Kontraktionsversuche an Chromatinabschnitten von *Chara-Spermatozoiden*. [Research in the stretching and contraction of chromatin sections of the spermatozoa of *Chara*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(3): 334-344. 12 fig. 1942.—During spermiogenesis the nucleus becomes birefringent at the moment when its size is decreased. The subsequent elongation of the nucleus is accompanied by a strong increase of birefringence, which is always negative in longitudinal direction. The birefringence is still more increased, but not uniformly so, when chromatin sections of the spermatozoa are stretched by microneedles. It is assumed that in these expts. the nucleic acid molecules are regularly oriented and that later on the polypeptide chains are unfolded. The chromatin of the *Chara* spermatozooids and the salivary chromosomes of the Diptera have a similar leptonic structure. In both cases the protein and nucleic acid molecules are highly oriented.—*Ludwik Monné.*

5112. Polandt, G. (*U. Strassburg, France.*) Cytologische Untersuchungen an Mutanten von *Antirrhinum majus* L. II. Mosaikpflanzen mit reziproken Translokationen. [Cytological studies on mutants of *A. majus*. II. Mosaic plants with reciprocal translocations.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(4): 388-406. 23 fig. 1942.—Plants of a certain genetic constitution exhibited a mosaic of various characters which were all due to genes located in an identifiable chromosome. Cytological analysis revealed the presence of a heterozygotic translocation in the chromosomes of these plants. A fragment of this identifiable chromosome was attached to various other chromosomes. The mosaic character of these plants is due to varying inactivation of the normal alleles of the investigated genes, an inactivation caused by the mentioned translocation.—*Ludwik Monné.*

5113. Stein, Emmy. (*Kaiser Wilhelm Inst., Berlin-Dahlem, Germany.*) Cytologische Untersuchungen an *Antirrhinum majus* mut. *Cancroidea*. Endomitosen-Entwicklung. [Cytological investigations on *A. majus* mut. *cancroidea*. Development of endomitosis.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(3): 308-333. 57 fig. 1942.—The mutant *cancroidea* of *A. majus* was obtained by radium irradiation. The following phenomena are produced by the recessive mutation characterizing these plants. At first the seedlings are diploid. After some time the cell divisions are disturbed and highly polyploid tissues are formed. The degree of polyploidy in the single cells is, however, very

variable. The cells and the nuclei become huge. Later the size and the form of the chromosomes are changed, chiefly in the cells beneath the shoot apices. The chromosomes grow and endomitoses, which are highly influenced by light and temp., take place.—*Ludwik Monné.*

5114. Straub, J. (Kaiser Wilhelm Inst., Berlin-Dahlem, Germany.) Untersuchungen über die zytologische Grundlage der Komplexheterozygotie. [The cytological bases of complex heterozygosity.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(1): 64-76. 16 fig. 1941.—The longitudinal pairing and chiasma formation of the chromosomes of *Rhoeo discolor* were investigated. In contrast to *Oenothera*, only small heterochromatic regions occur in the chromosomes of *Rhoeo*. In both cases, however, chromosome rings are formed. In *Rhoeo* this is preceded by a temporary longitudinal pairing in pachytene of the terminal segments of the chromosomes, their central regions remaining unpaired. The frequency of the chiasmata, detd. by counting the anaphase bridges formed by the chromosomes, is very large within the terminal segments.—*Ludwik Monné.*

5115. Swanson, C. P., and Alexander Hollaender. The frequency of x-ray-induced chromatid breaks in *Tradescantia* as modified by near infrared radiation. *Biol. Bull.* 91(2): 242. 1946.—An abstract.

5116. Tschermak, Elisabeth. Vergleichende und experimentelle cytologische Untersuchungen an der Gattung *Oedogonium*. [Comparative and experimental cytological studies on *Oedogonium*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(5): 493-518. 8 fig. 1943.—The chromosomes of 15 *Oedogonium* spp. were counted. One species has 9, 5 have 13, 4 have 17, 3 have 18, and 2 have 19 chromosomes. The structure of the chromosomes and of the resting nuclei is described. The morphology of the chromosomes is similar to that of seed plants. In spp. with small cells, the volume of the chromosomes is relatively smaller than in spp. with large cells. Polyploidy may be brought about by colchicine. Under colchicine influence, the chromosomes become thicker and shorter. The telophase nuclei of the 2 daughter cells show differences in size and in structure, due to the polar differentiation of the cytoplasm. The 2 poles of the cell exhibit certain differences in osmotic properties, in stainability with neutral red, and in the distribution of oil drops and chloroplasts.—*Ludwik Monné.*

#### ANIMAL

5117. Aubert, J., et R. Matthey. Le problème des hétérochromosomes chez les Perles (Plecoptères). [Heterochromosomes in the Plecoptera.] *Arch. Julius Klaus-Stift.* 18(3/4): 662-664. 7 fig. 1943.—Chromosome numbers and the sex chromosome condition are given for 8 spp. of Plecoptera, *Perla maxima*, *P. abdominalis*, *P. cephalotes*, *P. baetica*, *Dictyogenus fontium*, *Perlodes microcephala*, *Chloroperla grammica*, and *Nemura marginata*. From a comparative study the author suggests that chromosome numbers are increased by fragmentation, an original XY condition being followed by loss of the Y and later by fragmentation of the X into two parts.—*R. R. Gates.*

5118. Barigozzi, Claudio. (U. Milano, Italy.) I fenomeni cromosomici nelle cellule somatiche di *Artemia salina* Leach. [Phenomena exhibited by the chromosomes in the somatic cells of *A. salina*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(3): 251-292. 20 fig. 1942.—Polyploidy was observed in various tissue cells of both diploid and tetraploid *Artemia* races. Endomitosis is described in detail. Within the resting nuclei the chromosomes are more or less distinctly visible. They are fibrillar in most cases, but sometimes disk-shaped (nurse cells of the uterus). The spiral structure of the prophase chromosomes may or may not be visible.—*Ludwik Monné.*

5119. Barigozzi, Claudio. (U. Milano, Italy.) L'Azione della colchicina sulla morfologia et sulla struttura dei cromosomi, studiata nelle cellule somatiche di *Artemia salina* Leach. [The action of colchicine on the morphology and structure of the chromosomes in the somatic cells of *A. salina*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(3): 293-307. 16 fig. 1942.—Colchicine, employed in concs. which are

lethal for the nauplius and metanauplius of *A. salina*, altered the division spindle in the usual way, giving rise to nuclei with a doubled number of chromosomes. The structure of the chromosomes remains unaltered.—*Ludwik Monné.*

5120. Barigozzi, Claudio. (U. Milano, Italy.) Sulla struttura dei cromosomi in nuclei iperploidi di *Grylotalpa grylotalpa* L. Cellule di rivestimento del testicolo e cellule germinali. [The structure of the chromosomes in the hyperploid nuclei of *G. grylotalpa*. The follicular epithelial cells of the testicle and the germ cells.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(4): 345-366. 15 fig. 1942.—The diploid chromosome number of the investigated race of *Grylotalpa* is 18. In the follicular epithelial cells, however, the chromosome number was usually 36, sometimes 72. Within the resting nuclei the heterochromatin remains highly condensed and the euchromatic chromosomes are distinguishable as irregular spirals. The ♂ germ cells are sometimes also polyploid.—*Ludwik Monné.*

5121. Barigozzi, Claudio. (U. Milano, Italy.) I fenomeni cromosomici delle cellule in *Artemia salina* Leach. [The phenomena exhibited by the chromosomes in the germ cells of *A. salina*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(6): 549-575. 17 fig. 1943.—The most common polyploid parthenogenetic form of *Artemia* is tetraploid. Moreover, a triploid purely parthenogenetic and several polysome bisexual forms were discovered. The meiotic divisions of the diploid and polyploid parthenogenetic forms were compared. In the former, synapsis takes place, in the latter it fails to occur. The author demonstrates a pedigree of the different forms of *Artemia*. The volumes of the nuclei in these forms have been measured. The phenomena of apomixis and parthenogenesis are discussed.—*Ludwik Monné.*

5122. Bauer, Hans. (Kaiser Wilhelm Inst., Berlin-Dahlem, Germany.) Röntgenauflösung von Chromosomenmutationen bei *Drosophila melanogaster*. II. Die Häufigkeit des primären Bruchereignisses nach Untersuchungen am Ring-X-Chromosom. [X-ray induction of chromosome mutations in *D. melanogaster*. II. The frequency of primary breaks according to studies on the Ring-X-Chromosome.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(4): 407-458. 8 fig. 1942.—*Drosophila* ♀♀ were fertilized by ♂♂ previously exposed to X-rays. The eggs of these ♀♀ developed, but the percentage of ♂♂ obtained exceeded that of the normal sex ratio. This is due to zygotic lethal mutations which are produced by X-rays more frequently in the X than in the Y-chromosomes. These mutations may be gene or chromosomal. The sex ratio was strongly changed when the irradiated ♂♂ contained a ring-shaped X-chromosome; it was only slightly altered when the ♂♂ contained a normal X-chromosome. Thus the mutability of the ring X-chromosome is much higher than that of a normal one. The various lethal chromosome mutations occurring in both kinds of X-chromosomes are described in detail. The degree of the change in sex ratio is proportional to the dose of radiation employed. Some expts. indicate that the frequency of chromosome breaks is independent of wave length and of fractionation of the X-ray dose. Zygotes containing X-chromosomes which form bicentric double rings are not viable. 18.7% of the double rings are, however, eliminated.—*Ludwik Monné.*

5123. Bauer, Hans, und Jean Le Calvez. (Kaiser Wilhelm Inst. Biol., Berlin-Dahlem, Germany.) Das Verhalten der Chromosomen von *Ascaris megalocephala* nach Röntgenbestrahlung. [The behavior of chromosomes of *A. megalocephala* after x-irradiation.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(6): 593-617. 32 fig. 1944.—The chromosomes in the eggs of *A. megalocephala* undergo fragmentation under the influence of X-rays. The freshly broken surfaces of the chromosome fragments do not show any tendency to rejoin. Thus they exhibit the same behavior as the natural ends of normal chromosomes. When strongly irradiated the chromosomes become irregularly shaped and are crowded together during the meta- and anaphases.—*Ludwik Monné.*

5124. Bauer, Hans, und Witta Lerche. (Kaiser Wilhelm Inst., Berlin-Dahlem, Germany.) Die Auflösung von zygo-

tisch-lethale Mutationen bei *Phryne fenestralis* durch Röntgenbestrahlung der Spermien. [Induction of zygotic-lethal mutations in *P. fenestralis* by x-radiation of sperm.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen- u. Zellkern- u. Chromosomenforsch.* 2(5): 482-492. 2 fig. 1943.—Females of *P. fenestralis* were fertilized by ♂♂ previously exposed to the action of X-rays. The death rate of the developing eggs is dependent upon the dose employed and is represented by means of a curve which indicates that about 25% of the mortality is due to induced dominant lethal gene mutations or to single chromosome breaks, and that about 75% is due to multiple chromosome breaks. In irradiated oocytes apparently only dicentric single break recombinations occur while in the irradiated spermatozoa dicentric multiple break recombinations also take place. The mutation rate in *Phryne* is much higher than in *Drosophila*.—Ludwik Monné.

5125. Brenner, Sydney. (U. Witwatersrand, Johannesburg, S. Africa.) The chromosome complement of *Elephantulus*. *S. African Jour. Med. Sci.* 11(Biol. Suppl.): 71-78. 1 pl., 1 fig. 1946.—Chromosomes of *E. myrus jamesoni* were studied in squash preps. The diploid number of 14 was determined by analysis of ♂ germ cells and ♀ somatic cells; the haploid number of 7 by studies of 1st meiotic metaphases of ♂ and ♀ germ cells. In the ♂ complement, 6 of the pairs are homomorphic and range in length from 7.5 to 3  $\mu$ . The remaining pair is heteromorphic and consists of an X chromosome, 8.5  $\mu$  long, and a small Y chromosome, 2.5  $\mu$  long. The ♀ complement contains 2 X chromosomes, and the 6 homomorphic pairs. The X chromosome has an acrocentric spindle attachment and 2 secondary constrictions which are related to the production of plasmosomes.—S. Brenner.

5126. Diller, Irene Corey, and Bertina Blauch. (Lankenau Hosp. Res. Inst., Philadelphia, Pa.) The effect of diet on mitotic activity in intestinal epithelium of the mouse. *Growth* 10(3): 331-341. 8 fig. 1946.—Bacterial toxins used for tumor therapy affect dividing cells of normal mouse tissues as well as tumor cells. In the hope of overcoming gastric disturbances so produced, the authors tried to suppress the usually intense mitotic activity of intestinal epithelium through use of bland or fluid diets. Male and ♀ albino mice, approx. 60 days of age, were fed: (1) roughage-producing compressed foods; (2) milk only; (3) protein hydrolyzates in drinking water; and (4) water alone. The first starved animals succumbed at four days. The remaining animals were then sacrificed and counts made of mitoses in the intestinal villi. The number per field in animals fed on milk alone was as high as that of animals fed colony diet; and was as high or higher in animals fed on protein hydrolyzates, which provided no bulk at all. Cessation of mitosis was obtained only in the starved animals, which showed total degeneration of the villi at four days. Mitotic activity is apparently dependent on the nutritional state of the animal, and not on erosion and repair processes.—Authors.

5127. Ekblom, Tore. (State Bact. Lab., Stockholm, Sweden.) Chromosomenuntersuchungen bei *Salda littoralis* L., *Calocoris chenopodii* Fall. und *Mesobella furcata* Muls. u. Rey, sowie Studien über die Chromosomen bei verschiedenen Hemiptera-Heteroptera im Hinblick auf phylogenetische Betrachtungen. [Chromosome studies on *S. littoralis*, *C. chenopodii* and *M. furcata*, and studies on the chromosomes of various Hemiptera-Heteroptera in the light of their phylogeny.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen- u. Zellkern- u. Chromosomenforsch.* 2(1): 2-35. 5 pl., 3 fig. 1941.—The primitive species of this group of animals have a single large X-chromosome or several small X-chromosomes and one Y-chromosome. The chromosome number is large and the bouquet stage does not occur. The more specialized species have a single X-chromosome of smaller size or one X- and one Y-chromosome. The chromosome number is small. The bouquet stage is, as a rule, present but in some cases it may be secondarily suppressed.—Ludwik Monné.

5128. Frey-Wyssling, A. Doppelbrechung und Dichroismus als Mass der Nukleinsäure. Orientierung in Chromosomen. [Birefringence and dichroism as indication of the orientation of nucleic acid in chromosomes.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen- u. Zellkern- u. Chromosomenforsch.* 2(5): 473-481. 4 fig.

1943.—The author describes a method for calculating the degree of orientation of elongated molecules within birefringent bodies. The birefringence of the chromomeres within the living salivary chromosomes of *Chironomus* amounts to about 0.0002 and it must therefore be assumed that the degree of orientation of the elongated thymonucleic acid molecules is only about 3%. Thus but an insignificant portion of the thymonucleic acid molecules are oriented parallel to the polypeptide chains. Most of the nucleic acid molecules are spread in a disorderly manner. This finding is supported by the fact that the salivary chromosomes do not show any dichroism in ultraviolet light. The correctness of Caspersson's conclusions is emphasized.—Ludwik Monné.

5129. Geitler, Lothar. Zur Kenntnis des Kern- und Chromosomenbaus der Heuschrecken und Wanzen. [Information on nucleus and chromosome structure of grasshoppers and bugs.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen- u. Zellkern- u. Chromosomenforsch.* 2(6): 531-543. 58 fig. 1944.—The spiral structure of mitotic chromosomes was demonstrated in *Psophus stridulus*, *Gomphocerus*, *Stenobothrus* and *Locusta viridissima*. The short arms of the *Psophus* chromosomes consist chiefly of heterochromatin. They should not be confused with the centromeres. The resting nuclei of various tissues are tetra- and octoploid. No spiral structure and no centromeres could be demonstrated in the chromosomes of *Lygaens saxatilis* (Hemiptera), which were investigated during meiosis and mitosis.—Ludwik Monné.

5130. Holtfreter, Johannes. (McGill U., Montreal, Canada.) Experiments on the formed inclusions of the amphibian egg. III. Observations on microsomes, vacuoles, and on the process of yolk resorption. *Jour. Exptl. Zool.* 103(1): 81-112. 12 fig. 1946.—The reactions of yolk, lipochondria and microsomes of eggs of *Rana pipiens* to basic aniline dyes and to Feulgen's plasmal stain were examined. While being decomposed, the platelets tend to split into parallel layers showing positive birefringence with respect to the long axis of the platelets. Under the influence of certain salt solns. the lipochondrial fats combine with the vitellin of the dissolved yolk platelets to form a colloidal system surrounded by a semi-permeable contractile lipo-protein film. The reactions of these vesicles resemble those of the vacuoles which develop in the epidermis at the stage of yolk resorption, and persist throughout the period of larval development.—Auth. (courtesy Wistar Bibl. Serv.).

5131. Ito, T. (Med. Highsch. for Women, Tokyo, Japan), and K. Kubota. (Keio U., Tokyo, Japan.) Beiträge zur Kenntnis der Gewebsmastzellen mit besonderer Berücksichtigung des Golgiapparates derselben. *Cytologia* 13(3/4): 337-351. 23 fig. 1944.—Freshly fixed human skin from the axilla was used to study the mast cells, the metachromatic granules and their relation to Golgi body and chondriosomes. These cells are variable in shape and show evidence of amoeboid motility. The nucleus is round or elongated and may be rich or poor in chromatin. With toluidin blue the chromatin stains blue, the 1 or 2 nucleoli stain purple. The metachromatic granules, which had been shown to be heparin, vary in size and stainability, even within the same cell. They are given up into the surrounding tissues. The authors believe that they originate from chondriosomes and are continuously produced. The Golgi apparatus forms the light area near the nucleus. After osmication it consists of twisted strands or dense knots of fibers. It is usually situated at the end of the cell towards the nearest blood vessel.—Hans Ris.

5132. Krugelis, Edith J. (Columbia U., N. Y. C.) Distribution and properties of intracellular alkaline phosphatases. *Biol. Bull.* 90(3): 220-233. 17 fig. 1946.—Histochemical tests for alkaline phosphatase demonstrated that in the salivary gland chromosomes of *Drosophila* larvae, the enzymatic activity was localized in the chromosomal regions which are Feulgen positive, and thus correspond to the regions containing large concs. of desoxyribose nucleic acid. With mouse tissues, using different naturally occurring substances as substrates, there were obtained 3 types of phosphatase reaction based on the location of the enzyme activity within the cell. When Na glycerophosphate and nucleotides were used as substrates, a general reaction occurred in cytoplasm and nucleus. No enzymatic reaction occurred with polymerized desoxyribose nucleic acid as sub-



strate; but a definite reaction was indicated in the nucleus when partially depolymerized desoxyribose nucleic acid was used. When ribose nucleic acid was used, the reaction was mainly cytoplasmic. The 2 latter reactions are located in the same cellular regions as their specific substrates. These reactions are considered to be due to a nuclear phosphodiesterase, a cytoplasmic phosphodiesterase, and a phosphomonoesterase.—*E. J. Krugelis.*

5133. Kuhl, W., und G. Kuhl. Neue Ergebnisse zur Cytodynamik der Befruchtung und Furchung des Eies von *Psammecinus miliaris* Gmel. [New results as to cytodynamics of fertilization and cleavage of the egg in *P. m.*] *Biol. Gen.* [Vienna] 18(1/2): 135-203. 1944.—Time-interval studies were made on the egg of *P. miliaris*. Both immature eggs as well as the blastomeres of all furrowing eggs showed a movement of the granules. The gelatinous envelope of the living egg exhibited a fine radial striping, more distinct in immature than in mature eggs. The nuclear layer of immature eggs displayed a slow, steady undulation, whereas the nucleolus was quiescent. Cytological processes were studied in detail. Cytoplasmic currents were seen in the spindle-axis region. Superficial extension currents and "axial afflux" were absent. The spindle and astral rays were motionless. Movement other than the granular and mass compensating movements was confined to the furrow cutting into the egg at a constant rate. In the 32-cell stage and later, torsions of the whole embryo within the fertilization membrane were observed before division. These were invisible by normal observation which shows with what caution "symmetry planes" must be regarded. Another phenomenon revealed by time-interval studies was the amoeboid movement of the mesenchymatic cells during their migration from the blastoderm into the blastocoel. Gastrulation seems possible only under conditions of free and undisturbed motility of the blastula.—*Max Onno.*

5134. Lorkovic, Zdravko. Die Chromosomenzahlen in der Spermatogenese der Tagfalter. [Chromosome number in the spermatogenesis of the butterflies.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(2): 155-191. 46 fig. 1941.—Chromosomes were counted in the spermatocytes of 85 Lepidoptera species (Rhopalocera and Hesperoidea). The chromosome numbers of 58 species were previously unknown. The numbers 29 and 31 occurred most frequently. The lowest number, 11 chromosomes, was found in *Erebia medusae*; the highest number, 104 chromosomes, in *Leptidea duponcheli* (Pieridae). The latter is second only to *Phigalia pedaria* (Geometridae), where 112 chromosomes were counted (Regnaut). The chromosome numbers of *Leptidea sinapis* vary between 26 and 41. This great variation is quite exceptional among Lepidoptera. 23, 45 and 90 chromosomes were counted in the genus *Polyommatus*; 28, 54 and 104 in *Leptidea* and 20 and 40 in *Erebia*. These numbers are indicative of polyploidy. The type number of chromosomes in the Lepidoptera is 31. Nevertheless, deviating numbers were found: 25 in *Pieris*, 24 in *Melanargia*, 20 in *Erebia* and 24 in the family Lycaenidae.—*Ludwik Monné.*

5135. Matthey, R. L'ovogénèse et la cytologie de la parthénogénèse chez la Blatte *Pycnoscelus surinamensis* L. (Blatt. Panchlorinae). [Ovogenesis and the cytology of parthenogenesis in the blattid, *P. surinamensis*.] *Arch. Julius Klaus-Stift.* 18(3/4): 683-687. 4 fig. 1943.—This species is bisexual in the tropics and subtropics of the Old World, but in S. America as well as in Europe and the U. S. where introduced it has only ♀♀ with thelytokous reproduction. The author previously had suggested that ♀♀ were more resistant and triploid ( $2n = 38$ ). This hypothesis proves untenable. In breeding experiments a ♂ appeared with  $2n = 37$  (XO), the chromosomes in meiosis showing strong centromeric repulsion and no chiasmata. There were 18 rod pairs plus a V-shaped X, a diploid condition. In oogenesis the 38 chromosomes form temporary pairs followed by repulsion as in the ♂. The distal extremities of homologous chromosomes show attraction in ♂ and ♀. Origin of the ♂ is attributed to non-disjunction of the chromatids of one X-chromosome. Diploid parthenogenesis may be due to external factors acting on the chromosomes to increase their viscosity and the terminal attraction, thus suppressing the anaphase separation of pairs.—*R. R. Gates.*

5136. Patau, Klaus. (Kaiser Wilhelm Inst., Berlin-

Dahlem, Germany.) Cytologischer Nachweis einer positiven Interferenz über das Centromer. Der Paarungskoeffizient.

I. [Cytological determination of a positive interference with the centromere. The pairing coefficient. I.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(1): 36-63. 8 fig. 1941.—A positive interference with the centromere may exist in *Culex pipiens* and almost certainly does in the case of *Dicranomyia trinitata*. The method for calculating this interference is described in detail. The positive interference over the centromere should be regarded as a special case of the ordinary chiasma-interference. It is supposed that within the chromosomes there exists a central region of variable length where no chiasmata are formed.—*Ludwik Monné.*

5137. Peters, Joseph J. (Fordham U., N. Y.) A cytological study of mitosis in the cornea of *Triturus viridescens* during recovery after colchicine treatment. *Jour. Exptl. Zool.* 103(1): 33-57. 2 pl. 1946.—In the cornea of *T. viridescens* during recovery after colchicine treatment, unorientated and starlike patterns of chromosomal arrangement were interpreted as various degrees of spindle recovery and of colchicine influence. During recovery unorientated blocked metaphases were superseded by stars, and later stars were superseded by normal metaphases. Unorientated metaphases lacked both continuous and chromosomal spindle fibers. Stars lacked continuous fibers, and were probably formed by the activity of chromosomal fibers, SA-regions, and centrioles, working independently of continuous fibers. Chromosomal fibers appeared to recover more rapidly than continuous fibers. Although mitotic figures were rarely found in the corneal endothelium and the adjoining layers of the substantia propria of untreated salamanders, both abnormal and normal diploid mitotic figures were abundant during recovery after colchicine treatment. In this region at early prophase, extremely long and thin chromosomes occupied a large area and were usually about one layer deep.—*Auth. (courtesy Wistar Bibl. Serv.).*

5138. Pfeiffer, Hans H. Mikrurgisch-polarisationsoptische Beiträge zur submikroskopischen Morphologie larvaler Speicheldrüsenchromosomen von *Chironomus*. [Micurgical and polarisation-optical contributions to the submicroscopic morphology of the chromosomes of the larval salivary gland in *Chironomus*.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(1): 77-85. 3 fig. 1941.—Parts of isolated salivary-gland chromosomes of *Chironomus* are negatively birefringent in the longitudinal direction, the retardation amounting to about 2  $\mu$ . This birefringence is due to the chromomeres; no distinct birefringence could be detected within the interchromomeres. Within the chromomeres the elongated nucleic acid molecules are oriented parallel to the threadlike protein molecules and therefore the sign of birefringence is negative. The retardation is distinctly decreased if the chromosomes are elongated more than 20% by means of microneedles. Only the interchromomeres elongate appreciably when the chromosomes are stretched. This is attributed to the elongation of the polypeptide chains, which presumably are highly folded within the interchromomeres. The stretched chains may fold again under the influence of increased temp.—*Ludwik Monné.*

5139. Schmidt, W. J. Einiges über optische Anisotropie und Feinbau von Chromatin und Chromosomen. [Optical anisotropy and the minute structure of chromatin and chromosomes.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosoma: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(1): 86-110. 20 fig. 1941.—Clear photographs demonstrating the birefringence of various spermatozoa and of living and fixed salivary chromosomes of *Chironomus* are published to demonstrate the sensitiveness of polarization microscopy. It is emphasized, in opposition to Caspersson, that this method is not considerably inferior in sensitiveness to the method of investigating dichroism in ultraviolet light. The anisotropy of opposite sign or the isotropy of the living nuclei is not evidence that the nucleic acid molecules are arranged in a disorderly manner. The phenomena may be due to compensation; and an orderly submicroscopic structure may be present even in the case of isotropy. The appearance of birefringence under the influence of dehydrating agents (alcohol) is not evidence that the molecules are disarranged in living cells.—*Ludwik Monné.*

5140. Schrader, Franz. (Columbia U., N. Y. C.) Autosomal elimination and preferential segregation in the harlequin lobe of certain Discocephalini (Hemiptera). *Biol. Bull.* 90(3): 265-290. 1946.—In the testes of 4 species (*Mecistorhinus melanoleucus*, *M. tripterus*, *M. sepulchralis*, and *Neodine macraspis*) of the pentatomid tribe Discocephalini, the 5th lobe always shows a special type of meiosis, whereas the other 6 lobes are normal. There is no pairing in this lobe and just prior to metaphase I all the autosomes aggregate in one clump. The sex chromosomes dissociate themselves from this aggregate and behave normally through both divisions, dividing equationally in the 1st and reductionally in the 2d. One large autosome leaves the aggregate in the 1st division and joins the X and Y at one pole; the rest of the aggregate goes to the opposite pole. A large and a small 2d spermatocyte result. In the 2d division of the small cell, the single autosome goes to the same pole as the X in the great majority of cases, and its segregation is not a matter of chance. In the division of the large cell, the aggregate is pulled irregularly into 2 groups. Four main types of spermatids result: X + variable number of autosomes; Y + variable number of autosomes; X + 1 large autosome; Y. The latter 2 types probably never reach the mature sperm stage and none of the sperms from this lobe seems to take part in fertilization. From the hereditary point of view they are wasted. The occurrence of harlequin lobes in 4 spp. collected from localities as much as 5400 km. apart shows that it is a long and firmly established feature. The evolution of so wasteful a development must have some compensatory advantage, and its cytological and evolutionary significance is discussed.—F. Schrader.

5141. Serra, J. A., und A. Queiroz-Lopes. (U. Coimbra, Portugal.) Direkter Nachweis und Lokalisation von basischen Proteinen in den Chromosomen und im Nukleolus. [Direct detection and localization of basic proteins in the chromosomes and the nucleolus.] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(6): 576-592. 16 fig. 1944.—The arginine reaction was employed to detect basic proteins within various components of the nucleus. Within the chromomeres of the salivary-gland chromosomes of *Chironomus* the arginine reaction is strongly positive. This is, however, not the case within the interchromomeres. The thymonucleic acid of the chromomeres was removed by means of nucleases. The Feulgen reaction was now negative, while the arginine reaction remained positive. The same

results could be obtained on the mitotic chromosomes of *Vicia faba* and *Allium cepa*. It is concluded that histones are present within the chromomeres and globulins within the interchromomeres. The amount of histones is highly increased when the metaphase chromosomes are formed. Basic proteins are also present in the nucleoli. They are, however, absent within the alveolar inclusions of the nucleoli.—Ludwik Monné.

5142. Undritz, E. Hämatologische Beiträge zu Fragen der normalen und anormalen Zellbildung. [Hematological contributions on normal and abnormal cell formation.] *Arch. Julius Klaus-Stift.* 18(3/4): 718-721. 1943.—Preliminary account of mitoses in blood cells of man and various vertebrates. In rodents and other mammals, mitoses can be found in the blood erythroblasts, but they are more frequent in the nucleated red cells of salamanders and other vertebrates where pairs of cells can be seen. They also occur in bone marrow. In man, binucleate cells occur under regenerative conditions such as myeloses and pneumonia. Formation of twin neutrophils was seen in individuals heterozygous for Pelger's anomaly, and especially in homozygotes. Binucleate lymphocytes, plasma cells and normoblasts are cases of mitosis, not amitosis.—R. R. Gates.

5143. Wilson, Walter L. The effect of roentgen radiation on protoplasmic viscosity during mitosis. *Biol. Bull.* 91(2): 229. 1946.—An abstract.

5144. Wolf, Erich. (Kaiser Wilhelm Inst., Berlin-Dahlem Germany.) Die Chromosomen in der Spermatogenese einiger Nematoceren. [The chromosomes in the spermatogenesis of some nematocera (Diptera).] *Zeitschr. Zellforsch. u. Mikrosk. Anat. Abt. B: Chromosomen: Zeitschr. Zellkern- u. Chromosomenforsch.* 2(2): 192-246. 205 fig. 1941.—Meiosis was studied in *Dicranomyia trinitata*, *Thaumastoptera calceata*, *Tendipes plumosus*, *Glyptotendipes barbipes*, *Phalacrocerca replicata* and *Dictenidia bimaculata*. Leptotene and zygotene stages are missing, because of somatic pairing of the chromosomes. Chiasmata are formed but their number is small; counts were made in *Dicranomyia*. In *Penithetria holosericea* and in 2 *Scatopse* species the chromosomes do not form any chiasmata. All of the chromosomes in *Dicranomyia*, *Thaumastoptera*, *Tendipes* and *Glyptotendipes* exhibit the same behavior; but distinct heterochromosomes were observed in *Phalacrocerca*, *Dictenidia*, *Penithetria* and *Scatopse*. In the spermatogonia and in the follicular cells, pairing of the homologous chromosomes was observed.—Ludwik Monné.

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 5092, 5096, 5100, 5106, 5112, 5115, 5124, 5243, 5274, 5629, 5640, 5855, 5913, 5993, 6091, 6118, 6135, 6142, 6143, 6158, 6170, 6183, 6186, 6187, 6196, 6207, 6215, 6581, 6907, 6908, 6915, 6927, 6935, 6970, 7051, 7080, 7084, 7088, 7094, 7095, 7098, 7126, 7153, 7259, 7266, 7271, 7273, 7349, 7366)

### GENERAL

5145. Lea, D. E. (Strangeways Res. Lab., Cambridge, Eng.), and D. G. Catcheside. (Bot. Sch., Cambridge, Eng.) The bearing of radiation experiments on the size of the gene. *Jour. Genetics* 47(1): 41-50. 1945.—Objections to the 'target theory' of the biological action of radiations are considered to be invalid. Ionizations in irradiated tissue are not distributed at random but lie along the paths of ionizing particles; proportionality of effect to dosage implies only that a single ionizing particle, rather than a single ionization, is involved. The evidence for spread of ionizations and distance effects is weak; the lower effectiveness per ionization in the tissue, of neutrons as compared to x-rays, speaks strongly against the possibility that spreading of ionization effects is significant. Expts. on the inactivation of viruses and enzymes lead, on the basis of assumptions similar to those used in calculating gene size, to estimates of diameter correct to a factor of 2. The estimate of gene size for *Drosophila* is 4-8  $\mu$  diam. The length of the euchromatic region of the X chromosome in sperms is deduced to be 10-20  $\mu$ .—Bentley Glass.

### PLANT

5146. Blood, H. Loran. Breeding for wilt resistance in

the tomato. *Farm and Home Sci.* 7(3): 3, 14-16. 3 fig. 1946.

5147. Cheng, Chung-Fu. (Agric. Expt. Sta., St. Paul, Minn.) Self-fertility studies in three species of commercial grasses. *Jour. Amer. Soc. Agron.* 38(10): 873-881. 1946.—Clonal lines of creeping brome grass, crested wheatgrass, and meadow foxtail were grown in replicated trials and seed setting was studied under conditions of open-pollination, under isolation by the use of bags and by space isolation. Significant differences in seed setting between clonal lines within each of the 3 spp. were obtained both under open-pollination and under bags. There were wide differences also due to seasonal conditions. Under isolation in parchment bags, 19 of 29 clones studied in creeping brome, 3 of 34 clones in crested wheatgrass, and 23 of 24 clones in meadow foxtail were found to produce sufficient seed for the production of selfed plant progenies. In both brome grass and crested wheatgrass, seed setting under space isolation was higher than that under isolation in parchment bags. The few clones isolated in pairs indicate also that increased fertility could be obtained in this manner. Positive and significant inter-annual correlations were found in seed setting under open pollination in 1943 and 1944 for brome grass and crested wheatgrass, which indicated hereditary differences in seed-

setting ability. There was also a significant  $r$  value between seed setting under bags and under space isolation in brome grass. Clones of brome grass were selected that differed widely in seed setting ability under open-pollinated conditions. The clones with low seed setting ability under open-pollinated conditions produced a much higher percentage of aborted pollen, abnormal quartets and other cytological irregularities than clones with high seed setting ability.—*H. K. Hayes.*

5148. Dusseau, A. Blé dur issu du croisement de deux tendres italiens. [Hard wheat obtained from the crossing of two soft Italian wheats.] *Scientia Genetica* [Torino] 2(1): 79-81. 1940.—*Triticum vulgare erythrospermum* from Padua (Italy) crossed with *T. v. lutescens* from the Todaro collection produced a hybrid. The chromosome configuration with  $n = 14$  confirms the durum character which had been observed in the phenotype.—*A. Buzzati-Traverso.*

5149. Einset, John, H. Weston Blaser, and Barbara Imhofe. (Agric. Expt. Sta., Geneva, N. Y.) A chromosomal chimera of the Northern Spy apple. *Jour. Heredity* 37(9): 265-266. 1946.—Cytological studies were made of leaf and flower buds from large-fruited or "giant" sports of Rome, McIntosh, Jonathan, and Northern Spy apples to determine whether a tetraploid number of chromosomes was responsible for this condition. All, however, proved to be diploid with the exception of the "giant" Spy which was found to be a chromosomal chimera, doubtless occurring as a bud mutation of the Northern Spy. The stem tips consist of 2 layers of diploid cells covering a central core of tetraploid cells. In the stem proper, the pith and most of the vascular tissue are tetraploid. In the young leaves, palisade tissue, mesophyll, and the 2 outer cell layers are diploid, while tetraploid tissue, as far as has been detd., is limited to cells of the vascular system. The sporogenous tissue of the flower is diploid, appearing to have developed from the 2 outer layers, and the pollen is monoploid.—*B. R. Imhofe.*

5150. Ford, Joan Munro. (U. Tasmania, Hobart.) Morphological, inheritance and growth studies of the K saltation produced selectively by short wavelengths of ultra-violet irradiation in the fungus *Chaetomium globosum* Kunze (Ascomycetes, Sphaeriales). *Australian Jour. Exptl. Biol. and Med. Sci.* 24(3): 241-250. 8 fig. 1946.—Peculiarities of the growth, inheritance and morphology of the K instability which is produced in large numbers of colonies grown from spores surviving irradiation by short ultra-violet wavelengths of monochromatic irradiation are discussed. The K instability can always be reproduced from certain parts of the mycelium and in a number of cases it has been reproduced through several generations of spore sub-cultures. It is thought justifiable to call the "K" a saltation on account of the constant characteristics of the plant which make recognition of the type very certain. When colony diam. reaches 50-80 mm., growth of the colony or the sector is periodic and ceases from 3 to 10 days but is renewed again after this interval. The K saltation has not appeared in control colonies, and is almost absent with long wavelengths of monochromatic u.v. irradiation.—*Auth. summ.*

5151. Giles, Norman H. (Yale U., New Haven, Conn.) Induced biochemical mutants in *Absidia glauca*. *Jour. Bact.* 52(4): 504. 1946.—An abstract.

5152. Gisquet, P., J. Defrenoy, et A. Dusseau. Hybrides interspécifiques de Nicotiana. [Interspecific hybrids in Nicotiana.] *Scientia Genetica* [Torino] 2(1): 67-78. 1940.—A fertile hybrid of *N. tabacum* var. *purpurea*  $\times$  *N. petunioides* var. *silvestris*, when selfed, produced seeds from which lines have been bred up to the  $F_{13}$ , some of them showing fixed phenotypic characters. Cytological observation shows that a new fertile var. of tobacco has been obtained with  $n = 24$ .—*A. Buzzati-Traverso.*

5153. Guard, A. T. (Purdue U., Lafayette, Ind.) An abnormal fruit character in tomato. *Proc. Indiana Acad. Sci.* 55: 46-47. 1 fig. 1946.—A study was made of a tomato plant bearing abnormal fruits. These fruits consisted of an excessive number of carpels which did not fuse. The fruits were almost completely sterile. A study of the inheritance of this character indicated that it was due to the effect of a single recessive gene.—*A. T. Guard.*

5154. Jenkins, John Mitchell Jr. (Agric. Expt. Sta., Charleston, S. C.) Studies on the inheritance of downy mildew resistance and of other characters in cucumbers.

*Jour. Heredity* 37(9): 267-271. 2 fig. 1946.—Crosses were made between a var. of cucumber that was resistant to downy mildew (*Peronosplasmopara cubensis*), Puerto Rico No. 37, and a variety that was susceptible, Minnesota No. 7.36. The  $F_1$  was intermediate in its reaction to the disease and the  $F_2$  included plants that were similar to each of the parents in their reaction to downy mildew as well as other plants that were spread over the entire range of mildew reaction. Out of 665  $F_2$  lines, 1 line was as resistant as the resistant parent and 12 lines were as susceptible as the other parent. No significant association was obtained between reaction to downy mildew and the closely associated characters of spine color, mature fruit color, and mature fruit netting. There was no association between texture of spines and downy mildew reaction. The results indicated that more determinate plants were susceptible to downy mildew than indeterminate plants. Red-colored mature fruits had hard rinds but cream-colored mature fruits had soft rinds that could be punctured easily.—*J. M. Jenkins, Jr.*

5155. Kikuta, K., and W. A. Frazier. (Agric. Expt. Sta., Honolulu, Hawaii.) Breeding tomatoes for resistance to spotted wilt in Hawaii. *Proc. Amer. Soc. Hort. Sci.* 47: 271-276. 1946.—Several strains of *Lycopersicon pimpinellifolium* and *L. peruvianum*, German Sugar and BC 10 are resistant to spotted wilt in Hawaii. Pearl Harbor, a heavy yielding var. with refined fruits, developed from a cross of BC 10  $\times$  Bounty and released in Hawaii for resistance to spotted wilt, is an excellent source of resistance to the virus disease. The method of testing for resistance consists in the exposure of tomato seedlings in pots to infective thrips (*Thrips tabaci*) in a nursery planted to diseased Emilia plants. All susceptible and undesirable plants are eliminated before they are transferred to the field. Several homozygous resistant lines with large fruits of commercial size have been developed from crosses involving Pearl Harbor as one of the parents. Of 6,396 Pearl Harbor plants observed, 0.6% were killed by spotted wilt; of 2070 Bounty plants, 32.1% were killed. The resistance of Pearl Harbor is apparently due to a single dominant gene. Highly significant ratios of 3 resistant to 1 susceptible were obtained for  $F_2$  progeny of crosses of resistant  $\times$  susceptible lines. All  $F_1$  crosses with Pearl Harbor have been resistant.—*K. Kikuta.*

5156. McFarlane, J. S., E. Hartzler, and W. A. Frazier. (Agric. Expt. Sta., Honolulu, Hawaii.) Breeding tomatoes for nematode resistance and for high vitamin C content in Hawaii. *Proc. Amer. Soc. Hort. Sci.* 47: 262-270. 2 fig. 1946.—The wild species, *Lycopersicon peruvianum*, is proving of value in the development of a tomato var. resistant to the root knot nematode, *Heterodera marioni*, and high in vitamin C. Progress is slow because of the sterility between *L. esculentum* and *L. peruvianum*. 5 interspecific hybrids obtained with the aid of embryo culture are reported. One of these, a hybrid between a *L. hirsutum*-*L. esculentum* derivative and *L. peruvianum*, was extremely vigorous, resistant to several diseases, resistant to the root knot nematode, high in vitamin C, and self fertile.  $F_1$  and  $F_2$  inheritance data indicate that resistance to the root knot nematode is dominant. Backcrosses to *L. esculentum* are made with difficulty. A study of the resistance of  $F_1$ ,  $F_2$ , and  $F_3$  generations of a cross between the Michigan State Forcing var. and *L. peruvianum* made by the New Hampshire Expt. Station showed only tolerance to nematode attack. Reliable resistance data were obtained from tests made in artificially inoculated test beds. Segregates from hybrids between *L. esculentum* and *L. peruvianum* are intermediate in vitamin C content. The *L. peruvianum* species is heterozygous for nematode resistance and vitamin C content.—*J. S. McFarlane.*

5157. McLean, Susanne W. (Indiana U., Bloomington.) Interspecific crosses involving *Datura ceratocaula* obtained by embryo dissection. *Amer. Jour. Bot.* 33(8): 630-638. 12 fig. 1946.—Previously in *Datura* research, *D. ceratocaula* had not been made to hybridize with any other of the 9 herbaceous *Datura* spp. Arrested embryos occurred in each of the 9 possible interspecific crosses with *ceratocaula* as the  $\sigma$  parent and in only 3 of the 9 crosses with *ceratocaula* as the  $\rho$  parent. Through use of the embryo dissection and culture technique, one or more hybrids from each specific cross were grown to maturity. These were almost completely sterile. The arrested embryos varied greatly with the cross in form and frequency at the time of dissection. Racial differences



sometimes affect crossability as shown by the fact that one race of *D. leichhardtii* gave >8 times as many arrested embryos as another race when pollinated by *ceratocaula*. Some *ceratocaula* characters were dominant in the hybrids, some intermediate and some recessive, while in some cases the hybrid had characters not evident in either parent. The very poor seed germination of *ceratocaula* has been increased markedly by culturing the embryos in an agar nutrient of sucrose and inorganic salts.—S. W. McLean.

5158. Miège, Em. L'hérédité de la composition chimique chez les hybrides intergénériques. [Heredity of chemical composition in intergeneric hybrids.] *Scientia Genetica* [Torino] 2(1): 82-91. 1940.—A chemical analysis has been carried out on the hybrid seeds obtained by crossing *Aegilops ovata* var. *nigra* with *Triticum vulgare* var. *alborum* and with *T. durum* var. *melanopus*. The content of water, ash, N, starch, sugars, fats and P is given. Seeds of *Aegilops* and *Triticum* differ strikingly in chem. composition, and the F<sub>1</sub> seeds are intermediate in chemical characters. In the following generations, at least a partial return towards the parental types takes place. The *Aegilops* characters seem to be dominant.—A. Buzzati-Traverso.

5159. Quinby, J. R., and R. E. Karper. (Agric. Expt. Sta., College Station, Texas.) Heterosis in sorghum resulting from the heterozygous condition of a single gene that affects duration of growth. *Amer. Jour. Bot.* 33(9): 716-721. 1946.—Sorghum plants homozygous and heterozygous for the *Ma* gene that influences time of floral initiation were weighed and their tillers counted. This gene in the heterozygous condition, *Ma ma*, produces plants that differ in maturity from homozygous genotypes. In addition, the heterozygous condition of this gene produces plants that are larger and tiller more than homozygous genotypes of comparable growth duration. The conclusion is that heterosis in sorghum is a stimulation to tillering and cell division. When the stimulus to meristematic growth is contributed by the heterozygous condition of the *Ma ma* gene, dominant genes *Ma<sub>2</sub>* and *Ma<sub>3</sub>* which delay floral initiation and maturity allow the stimulus to act over a longer period of time. This condition results in a greater expression of hybrid vigor in *Ma<sub>2</sub>Ma<sub>2</sub>* and *Ma<sub>3</sub>Ma<sub>3</sub>* than in *ma<sub>2</sub>ma<sub>2</sub>* and *ma<sub>3</sub>ma<sub>3</sub>* genotypes, even these genes contribute nothing in the way of a stimulus to meristematic growth.—J. R. Quinby.

5160. Richey, F. D. (Agric. Expt. Sta., Knoxville, Tenn.) Corn cob fur. *Jour. Heredity* 37(8): 251-252. 2 fig. 1946.—Reports and illustrates a fragment of corn cob covered with a reddish hair-like growth. The hairs appear to be wild fibers from that part of the vascular system which normally supplies the developing kernels. The origin of the fragment is unknown.—F. D. Richey.

5161. Sinoto, Y., e D. Sato. Poliploidi da colchicina in *Fagopyrum*. [Colchicine-induced polyploids in *Fagopyrum*.] *Scientia Genetica* [Torino] 1(4): 354-369. 1940.—Polyploids have been induced in *F. esculentum* (*n* = 8) with colchicine. When seeds were germinated on filter paper, previously dipped into a colchicine solution, only dwarf plants were obtained; when plumules of seedlings were directly handled with colchicine soln. a number of tetraploids, octoploids and mixoploids were produced. The number of nucleoli in the microspores was found to be proportional to the degree of polyploidy. The best method to distinguish polyploids from diploids consists in the measurement of the size of stomata. In mixoploids, development takes place at a higher rate in cells with a lower number of chromosomes than in those with a higher degree of polyploidy. Genetical studies on heterostylism, self-sterility and dwarfism are discussed in connection with the results obtained from colchicine treatment.—A. Buzzati-Traverso.

5162. Smith, Harriet E. (U. Michigan, Ann Arbor.) *Sedum pulchellum*: A physiological and morphological comparison of diploid, tetraploid, and hexaploid races. *Bull. Torrey Bot. Club* 73(6): 495-542. 42 fig. 1946.—A statistical comparison was made of the diploid, autotetraploid, and autohexaploid races of *S. pulchellum* collected from 39 stations throughout the geographic range of the species. The races differed significantly in the size of juvenile and mature leaves, diam. of juvenile stems, number of flowering shoots, number of flowers per inflorescence, and size and wt. of seeds. In general, an increase in size accompanied an increase in chromosome number. Certain exceptions to this

general relation were noted: length of the mature leaves decreased with increase in chromosome number, and the mature leaves of the tetraploids were narrower than those of the diploids. The mature leaves of the hexaploids, however, were wider than those of the diploids. With each additional set of chromosomes there was an increase in the number of flowering shoots but a decrease in the number of flowers per inflorescence, making it probable that the tetraploids would have the most flowers and the hexaploids the fewest. Although addition of one extra set of chromosomes was not sufficient to effect a significant change in the ratio of length to width of mature leaves or the number of flowers per inflorescence, addition of 2 sets of chromosomes resulted in significant changes. No statistically significant difference was found in the diam. of the length of the flowering shoots. In addition to the differences among races, the various selections within each race differed significantly among themselves in size of leaves and seeds. Statistical analysis was made of cell size, and a highly significant difference was found between races. The areas of the epidermal cells of primary leaves were found to be in the proportion 1.00:1.16:1.67 for diploids, tetraploids, and hexaploids, respectively. The hexaploid race was able to withstand both an excess and a deficiency of water better than the other 2 races; the diploids had the poorest survival under both of these extremes. The diploids were superior to the other 2 races in ability to withstand tannic acid in the soil. The hexaploids were injured most severely by the tannic acid. In competition within and among races, the hexaploids were most successful and the diploids were least successful. Although cuttings of all 3 races rooted readily, the root development of the tetraploids surpassed that of the other 2. The hexaploids developed the smallest root systems. There was a progressive decrease in growth hormone content with increase in chromosome number. Diploids flowered 12 days earlier than the tetraploids, which in turn were about 4 days earlier than the hexaploids. The dry wt. of the tetraploids was much greater than that of the other 2 races. No significant difference was found in the water content of the 3 races.—H. E. Smith.

5163. Stubbe, H. L'influenza della nutrizione sull'insorgere di mutazioni. [The influence of nutrition on the production of mutations.] *Scientia Genetica* [Torino] 1(4): 370-384. 1940.—Expts. have been carried on in order to determine whether different types of nutrition could have an influence on the mutability of *Antirrhinum majus*. Young plants were grown on quartz sand dipped into aqueous nutrient solns., and the number of mutants segregating in F<sub>2</sub> was taken as a measure of the mutation rate of the treated plants. The mutation rate of plants grown without N, or P, or S was significantly higher than that of plants grown with normal nutrient solns. Some plants after the 5th week of life on normal solns. were transferred to pure sand dipped into dist. water; they succeeded in producing flowers and some seeds from which plants were obtained which showed a normal mutation rate. From such results the conclusion can be drawn that the agent inducing a higher mutation rate is not starvation but metabolic disharmonies produced by the absence of single elements. When plants grown in absence of P were irradiated with X-rays (6,000 r units), a much higher mutation rate was observed than in plants which had received a normal nutrition and the same dosage of X-rays. Details are given concerning the relation between morphological damage produced by the lack of nutrient elements, and mutability.—A. Buzzati-Traverso.

5164. Suneson, C. A., and W. K. Pope. (U. S. Dept. Agric., Washington, D. C.) Progress with *Triticum* × *Agropyron* crosses in California. *Jour. Amer. Soc. Agron.* 38(11): 956-963. 2 fig. 1946.—Results over a 7-yr. period with derivatives from wheat crossed with *A. elongatum* or *A. trichophorum* in a habitat which imposes summer dormancy and a selection procedure which favors cross-fertilization, longevity, and fertility are reported. The results have been sufficiently promising from both practical and scientific viewpoints to encourage more extensive investigation. The best yields of perennials have been only 60% of those for wheat for a single harvest, but the quality characteristics of wheat have been recovered. Perennialness is quite readily recovered as well as a wide range in stem root reaction. Most stocks cross readily with wheat. The "mop" character, which is fairly common, affords a practical means for thickening

stands. A practical utilization of present derivatives seems more likely in a conservation and acreage limitation economy than in one of maximum production.—C. A. Suneson.

5165. Walker, J. C., and R. E. Foster. (Agric. Expt. Sta., Madison, Wis.) The inheritance of ascorbic acid content in cabbage. *Amer. Jour. Bot.* 33(9): 758-761. 1946.—A study was made of 23 F<sub>1</sub> hybrid progenies from crosses between an inbred line of cabbage high in ascorbic acid content and yellows-resistant vars. and strains which had a much lower range of acid content. The ascorbic acid mean value was intermediate between mean values of the corresponding parent progenies, and in all but one case the mean of the F<sub>1</sub> was not far removed from the arithmetic and geometric means of the parents. In 8 F<sub>2</sub> progenies studied, the frequency distribution of the ascorbic acid values of individual heads approximated a normal curve and the range of acid content was wider for the F<sub>2</sub> than for parent progenies. F<sub>2</sub> progenies varied in the difference between their standard deviations of those of the respective parent progenies, indicating that the parent plants selected differed in the genes governing ascorbic acid content. It is concluded that ascorbic acid content is inherited as a quantitative character and the indications are that the average ascorbic acid values of standard yellows-resistant varieties may be raised considerably with retention of resistance and major horticultural characteristics by a process of controlled crossing and selection.—J. C. Walker.

5166. Walter, E. V., and Arthur M. Brunson. (Agric. Expt. Sta., Lafayette, Ind.) Selection for aphid resistance within inbred lines of maize. *Jour. Amer. Soc. Agron.* 38(11): 974-977. 1946.—Three inbred lines of maize, L, 38-11, and Ldg, previously inbred for 22, 16, and 12 generations, respectively, were subjected to divergent selection for resistance to the corn leaf aphid, *Aphis maidis*. After 4 generations of selection, consistent differences in reaction to aphids were found among sub-lines of inbred L. Slight progress due to selection was indicated in one sub-line of inbred 38-11 but little or none in another sub-line. In inbred Ldg, 2 strains, separated before this expt. started, maintained their initial differences. It is concluded that effective selection for insect resistance may be made in some inbred lines but probably not in all.—Authors.

5167. Warmke, H. E. (Inst. Trop. Agric., Mayaguez, P. R.) Sex determination and sex balance in *Melandrium*. *Amer. Jour. Bot.* 33(8): 648-660. 6 fig. 1946.—Numerous polyploid and aneuploid plants of *M. dioicum* have been obtained and used to study the role of the X chromosome, of the Y chromosome, and of the autosomes in sex determination. The following series: (1) 2A XX, 2A XXY, (2) 4A XXX, 4A XXXY, (3) 4A XXXX 4A XXXXY, and (4) 4A XX, 4A XXY, 4A XXXY, in each of which the number of Y chromosomes is the sole variable, indicate that the Y has strong male-determining genes. The series (1) 2A XY, 2A XXY, and (2) 4A XY, 4A XXY, 4A XXXY, and 4A XXXXY, in which the number of X chromosomes is the variable, indicate that the X contains ♀ determiners, but less potent than the ♂ determiners of a single Y. Evidence derived from 2A XXY, 3A XXY, 4A XXY plants and from an investigation of the X/A ratio, which may range from 0.5 to 1.5 without altering sex, indicates a relative unimportance of the autosomes in balanced sets in sex determination. Moreover, a study of a number of trisomic plants and of the offspring of triploids has failed to show any sex determiners, either ♂ or ♀, in individual autosomes. A brief review of the literature relating to the location of sex determiners is given, including a discussion of methods of some theoretical considerations.—H. E. Warmke.

5168. Winge, O. Croisement interspécifique chez les champignons. [Interspecific crossings in fungi.] *Scientia Genetica* [Torino] 2(2/3): 171-189. 1942.—It is possible to distinguish 2 types of interspecific hybrids in fungi: those having cells containing haploid nuclei of different spp. which do not fuse (interspecific dicaryophytic hybrids), and those having cells containing haploid nuclei of different spp. which actually fuse and give origin to a diploid hybrid nucleus (true interspecific hybrids). Among the previously published expts. on interspecific crossings in fungi, only the following belong to the category of true species hybrids: Burgeff's expts. with spp. of *Phycomyces*, Rodenhiser's and Holton's expts. with *Ustilagineae*, Dodge's expts. with *Neurospora*,

and those with *Saccharomycetes* of Winge and Laustsen, which have been confirmed by Yamamoto and Takizawa. The expts. of the author on several spp. are described in detail.—A. Buzzati-Traverso.

5169. Zamenhof, Stephen. Unstable strains of the colon *Bacillus*. *Jour. Heredity* 37(9): 273-275. 1 fig. 1946.—The writer has isolated 2 unstable strains of *Bacillus colimutabile* which mutate to each other with a high frequency but without forming papillae. One of the strains is a slow lactose fermenter and forms long chains. The other behaves like typical *Escherichia coli*. Taking into consideration the effect of chain formation, the mutation rate has been estimated at 1 per 1,000-5,000 individual cell divisions. Further study reveals also non-hereditary variations, such as mucus, capsule and alkali formation, all induced by alkali engendered by other cells. These variations are interwoven in a rather complicated pattern with the above-mentioned hereditary changes (mutations).—Auth. abst.

5170. Zhebrak, Anton R. (Timiriachev Agric. Acad., Moscow, USSR.) New amphidiploid species of wheat and their significance for selection and evolution. *Amer. Nat.* 80(790): 271-279. 1946.—Amphidiploid species of wheat have been produced from the following interspecific hybrid combinations: *T. durum* × *monococcum* (2n = 42), *T. durum* × *timopheevi* (2n = 56), *T. turgidum* × *timopheevi* (2n = 56), *T. persicum* × *timopheevi* (2n = 56), *T. polonicum* × *timopheevi* (2n = 56), *T. polonicum* × *durum* (2n = 56), *T. vulgare* × *timopheevi* (2n = 70), *T. durum* × *vulgare* (2n = 70). In the case of some of these, particularly the 56-chromosome types involving *T. timopheevi* and some member of the emmer series, several different strains of each species were used, so that a number of different strains of the amphidiploid were obtained. The 56-chromosome types are all interfertile, and are described elsewhere as vars. of a new species, *T. soveticum* Zhebrak. Hybrids between this species and *T. vulgare*, and between different amphidiploid species are highly sterile. In these hybrids certain dominant genes, such as that for spike color, still exhibit their dominance, even though present only once along with a double or triple dose of the recessive allele. Amphidiploids between species with homologous genomes, like *T. polonicum-durum* and *T. vulgare-durum* are much more sterile than those whose parents have non-homologous genomes. Their fertility can, however, be increased by selection.—G. L. Stebbins, Jr.

#### ANIMAL (EXCEPT MAN)

5171. Baltzer, F. Weitere Beobachtungen an Pigment-chimären von Amphibien. [Further observations on pigment chimeras in amphibians.] *Arch. Julius Klaus-Stift.* 18 (3/4): 664-671. 4 fig. 1943.—Expts. in transplantation of tissue containing pigment cells between the tree frog, *Hyla arborea*, and *Bombinator pachypus*. Transplantation in the larval condition results in pigment chimeras in which the subsequent history of the melanophores is described.—R. R. Gates.

5172. Bostian, C. H. (North Carolina State Coll., Raleigh), and P. W. Whiting. (U. Pennsylvania, Philadelphia.) Stability of the sex alleles of *Habrobracon*. *Amer. Nat.* 80(794): 547-558. 1946.—Counts totalling 56,913 ♀♀, 7,471 diploid ♂♂ and 41,899 haploid ♂♂ were made in a population derived from a single crossbred virgin ♀ mated to one of her haploid sons. Descendants were inbred by sibling matings in 9 different lines for 10 generations after which the lines were crossed in various ways and the counts were made. Ratios of diploid ♂♂ to ♀♀ differed in the different lines and in the different types of crosses, ranging from less than 1% to almost 25%. These ratios were not associated with ratios of ♀♀ to haploid ♂♂ or with average numbers of ♀♀ per fraternity as would be expected if mutation had occurred in any one line in one of the 2 sex alleles derived from the single crossbred ancestral ♀. There were, however, 11 "mutant" fraternities lacking diploid ♂♂ and having high ♀ ratios and relatively large numbers of ♀♀. Their deviation may be explained by hereditary and environmental conditions causing high fecundity and high ratios of eggs fertilized, by a possible sex-linked semilethal and by errors of sampling, rather than by mutation of a sex allele. Data suggest influence of heterosis and of maternal genotype on viability of diploid ♂♂.—P. W. Whiting.

5173. Buckner, G. Davis, Elizabeth F. Wachs, and

Amanda Harms Henry. (*Agric. Expt. Sta., Lexington, Ky.*) An unusual growth of bone in chickens. *Jour. Heredity* 37(9): 284. 1 fig. 1946.—There is described and illustrated an anomalous skeletal variation in which the proximal ends of the right lateral internal and right lateral external processes of the sternum of a chicken are joined by a bony arch. The anomaly is unilateral and occurred in one 12-weeks old pullet and in a cockerel of the same age. This is the first time the condition has been observed in the flock at the station and no other cases have been found in the literature. Nothing is known of the genetic relationship of the 2 individuals affected except that they came from the same flock and were the same age.—*L. M. Dickerson.*

5174. Cunha, Antonio Brito da. (*U. São Paulo, Brazil.*) Polymorphism in natural populations of a species of *Drosophila*. *Jour. Heredity* 37(8): 253-256. 2 fig. 1946.—The results obtained suggest that the variation in the abdominal pattern of *D. polymorpha* is due to 2 alleles of a single gene; neither of the alleles being either dominant or recessive. The relatively great variation observed in the heterozygotes may be explained in 2 ways. The data now available do not permit discrimination between these alternatives. For reasons which are as yet unknown, a greater % of the heterozygotes than of the homozygotes reaches maturity in cultures. No data are available at present to show whether similar excesses of heterozygotes occur in natural populations as well.—*L. M. Dickerson.*

5175. Dalton, Howard C. (*Stanford U., Calif.*) The role of nucleus and cytoplasm in development of pigment patterns in *Triturus*. *Jour. Exptl. Zool.* 103(1): 169-196. 3 pl. 1946.—Embryos whose cells consist of nucleus from one species combined with cytoplasm from another were developed from enucleated *Triturus rivularis* eggs fertilized by *T. torosus* sperm. The pigment pattern produced by their melanoblasts has been studied by means of neural crest transplantation. The androgenetic hybrid pattern resembles in most respects that of the nuclear donor species. A characteristic of the cytoplasmic donor species is manifest in the number and distribution of melanophores on the flank. This cytoplasmic effect in development of the pigment pattern is interpreted on the basis of functional properties of the cytoplasm affecting the rate of melanization and is considered an illustration of the way in which cytoplasmic qualities determined very early in development may later become critical factors in the differentiation of a specific genetic characteristic.—*Auth. (courtesy Wistar Bibl. Serv.).*

5176. Gordon, Myron. (*New York Zool. Soc.*) Introgressive hybridization in domesticated fishes. I. The behavior of comet, a *Platyopocilus maculatus* gene in *Xiphophorus hellerii*. *Zoologica [New York]* 31(2): 77-88. 3 pl. 1946.—The Mexican platyfish gene  $P^{Co}$ , one of 7 dominant, multiple, autosomal alleles, produces a simple comet-like pattern in the tail fin in wild *P. maculatus*. Representatives of the comet gene  $P^{Co}$  are found in natural populations of the platyfish in the Rio Jamapa and Rio Papaloapan but not in the Rio Coatacoalcos and the Rio Usumacinta. When a "wild" *P. maculatus* carrying  $P^{Co}$  is mated with "domesticated" platyfish or with "wild" *Xiphophorus hellerii*, the phenotype of the hybrids show all the fins considerably darker, producing a new variety termed the "wagtail". The modified effect of  $P^{Co}$  from the comet to the wagtail is due to a specific factor  $E$  which has no visible effect of its own.  $E$  is autosomal and independent of the  $P^{Co}$ ,  $P^{M}$ ,  $P^{Mc}$ ,  $P^{Co}$ ,  $P^{C}$ ,  $P^{C'}$  series and of  $st$ . It is suggested that "domesticated" stock of *P. maculatus* acquired the  $E$  factor by a process of introgression. The Platyfish gene  $P^{Co}$  was transferred by hybridization to platyfish-swordtail hybrids. By a series of backcrosses of the hybrids to the swordtail, fish were bred having the configuration of *X. hellerii* but containing  $P^{Co}$  of *P. maculatus*. This new var. is called the wagtail swordtail among fish fanciers. The establishment of this new stock is an example of introgressive hybridization under conditions of domestication. Hybridization under natural conditions has not been known to take place. The domesticated red swordtail of aquarists is considered and its origin is traced to "red" gene of *P. maculatus* modified by intensification by at least 2 *X. hellerii* genes. These effects resemble the behavior of taxonomic characters in species crosses. Taxonomic characters at the lowermost levels, sub-species and perhaps spp., are compared genetically with color pattern characters.

A number of genetic similarities and parallelisms of introgressive hybridization in cotton plants and xiphophorus fishes are indicated.—*Myron Gordon.*

5177. Gowen, John W., Janice Stadler, and Leslie E. Johnson. (*Iowa State Coll., Ames.*) On the mechanism of heterosis. The chromosomal or cytoplasmic basis for heterosis in *Drosophila melanogaster*. *Amer. Nat.* 80(794): 506-531. 1 fig. 1946.—This paper presents a study of vigor in random bred stock and inbred and homozygous races of *Drosophila melanogaster*. Egg production is used as a measure of vigor. The results show that inbreds from continued brother by sister pair matings may retain some of their genes in heterozygous condition over many generations. "Homozygous" lines, formed by outcrossing, in general, show lower yields than the inbreds from which they originated. This observation would agree with the hypothesis that the cause of hybrid vigor lies in differences in genic interaction between alleles and their reaction products. This result would not be expected if the cause of hybrid vigor lay in some, as yet unidentified, physiological stimulation resulting from the union of unlike gametes.—*J. W. Gowen.*

5178. Hadorn, E., und A. Lachenal. Über die Penetranz einer genbedingten Flügelabnormität bei *Drosophila melanogaster*. *Arch. Julius Klaus-Stift.* 18(3/4): 671-678. 1943.—The autosomal factor Delta, affecting the wing veins, is a short deficiency, a homozygous lethal. There are numerous Delta mutations, some produced by X-rays, differing in expressivity. When a  $DI^7$  stock is crossed with a certain balanced lethal stock the  $F_2$  produces a range of wings, like the balloon series of mutations. The strong and weak Delta mutants are interpreted as due to a main factor with modifiers, the blisters in Delta stock being produced by a genic or environmental intensifying of the Delta effect. The penetrance of blisters increases with falling temp. and is independent of sex. Increased blister formation runs parallel with increased hairiness (homotropy).—*R. R. Gates.*

5179. Lush, Jay L. (*Iowa State Coll., Ames.*) Chance as a cause of changes in gene frequency within pure breeds of livestock. *Amer. Nat.* 80(792): 318-342. 1946.—Chance deviations in gene frequency from one generation to the next, as a result of Mendelian sampling and the elimination of potential parents, are important in the pure breeds of livestock. Studies of inbreeding and relationship within 9 breeds of cattle, 4 breeds of horses, 2 of sheep, and 2 of swine indicate that these chance changes in gene frequency from one generation to the next usually have a magnitude of around 0.02 to 0.05. The major cause for these chance changes being so much larger than would be required automatically by the finite size of the population seems to be inequality in the number of gametes which the various potential parents actually contribute to the next generation. Attention to family and pedigree when selecting breeding stock accentuate this. Economic incidents, which make whole herds more important or less important as sources of breeding stock for other purebred herds, also increase the correlation between the fates of relatives. Presumably these circumstances make chance fluctuations in gene frequency more important in purebred livestock than in most wild spp., but that remains debatable in the absence of exact information about the actual pedigrees of wild animals.—*J. L. Lush.*

5180. Mittler, Sidney. (*Bowling Green State U., Ohio.*) Production of female offspring by virgin females in the greenhouse white fly, *Trialeurodes vaporariorum*, under the influence of high temperatures. *Amer. Nat.* 80(794): 532-546. 1946.—Virgin ♀♀ of *T. vaporariorum* normally produce eggs that hatch into ♂♂; fertilized eggs result in ♀♀. Under the influence of high temp. (38°-43°C), the virgin ♀♀ were induced to produce some ♀♀. Multiple heat treatments were more successful in production of these exceptional ♀♀. Low temp. failed to induce virgin ♀♀ to become thelytokous. Virgin ♀♀ that had been exposed to high temp. in the pupal stage failed to produce ♀♀. Unfertilized eggs exposed to high temp. developed only into ♂♂. Exceptional ♀♀ have the same diploid number of chromosomes, 22, as the stock (control) ♀♀. Virgin exceptional ♀♀ produced only ♂♂ at 20°C. Virgin ♀♀ were also permitted to feed on *Colchicum autumnale*, and in 2 of the 11 expts. 3 exceptional ♀♀ were found. The production of ♀♀ by virgin ♀♀ may be due to the retention of the diploid number of chromosomes in the egg under the influence of



high temp. The 2d polar body may fuse with the egg nucleus or there could be a faulty separation of the chromosomes during one of the divisions in the maturation process.—*Sidney Mittler.*

5181. Ponce, Kitty. *Génotype et phénotype sexuel chez les Vertébrés.* *Arch. Julius Klaus-Stift.* 18(3/4): 612-631. 1943.—Discussion of sex determination and sex alteration in vertebrates, citing the cytological and exptl. work. The author recognizes the fundamental sexual bi-potentiality of ♂ and ♀ and reversibility of sex as detd. by chromosomes. This is shown by free-martins in cattle, pigs, goats, cats and dogs as well as certain humans. Parabiologic grafts also show that embryonic substances (inductors or hormones), emitted by the gonads from their first formation, can produce inversion of the sexual phenotype of both soma and germ cells. The author adapts Witschi's view that the gonad cortex emits cortexin, the medulla medullarin, the ovary being mainly cortical and the testes mainly medullary in activity. It is concluded that the embryonic and adult hormones involved are very similar, but to attribute directly to genes the secretion of sexual hormones is putting the cart before the horse.—*R. R. Gates.*

5182. Poulson, F., and E. J. Boell. A comparative study of cholinesterase activity in normal and genetically deficient strains of *Drosophila melanogaster*. *Biol. Bull.* 91(2): 228. 1946.—An abstract.

5183. Rhoad, A. O. (*Inter-Amer. Inst. Agric. Sci., Turrialba, Costa Rica*), and R. J. Kleberg, Jr. (*King Ranch, Kingsville, Texas*). The development of a superior family in the modern quarter horse. *Jour. Heredity* 37(8): 227-238. 9 fig. 1946.—This is an analysis of one of the outstanding families of the modern Quarter Horse in its formative stage. Through a judicious system of line-breeding as indicated in some of the pedigrees, the superb qualities of Old Sorrel can be carried on for many years to come. Additional information concerning % of inbreeding and blood relationships of all foals is contained in 4 detailed tables filed with the American Documentation Inst., 1719 N. Street, N. W., Washington 6, D. C.—*Auth. abst.*

5184. Rings, Roy W. (*Fourth Serv. Command Med. Lab., Ft. McPherson, Ga.*) Gynandromorphism in *Culex nigripalpus*. *Jour. Econ. Ent.* 39(3): 415. 1946.—A gynandromorphic specimen of this species is described as having typical ♂ antennae and palpi; the legs and wings were proportionately more slender, as in normal ♂♂, than analogous ♀ structures. The genitalia, size and shape of the abdomen and the abdominal scale pattern were characteristically ♀.—*R. W. Rings.*

5185. Steiner, Hans. Experimenteller Nachweis des erblichen Verhaltens eines Falles von partiellem Albinismus bei einem Wildvogel, *Aidemosyne cantans* (Gm.). [Exptl. determination of the genetic relationship of a case of partial albinism in a game bird, *A. cantans*.] *Arch. Julius Klaus-Stift.* 18(3/4): 699-703. 3 fig. 1943.—An imported ♂ silver pheasant had a white fleck on the head similar to some doves and canaries. It was crossed with a Japanese *Uroloncha acuticauda* strain having a similar white patch. The F<sub>1</sub> showed 4 with neck-band and 4 without, but the hybrids were sterile. The ♂ *A. cantans* mated with a normal ♀ of its own species produced 7 F<sub>1</sub> birds with no neck-band. One of these back-crossed to the father produced 1 young with the band and one without. The mutational origin of the neck-band as a single gene difference is significant, as a neck-band is a specific character in many spp. of birds.—*R. R. Gates.*

5186. Villee, Claude A. (*Harvard U., Cambridge, Mass.*) The genetic control of growth metabolism. *Proc. Nation. Acad. Sci. U. S. A.* 32: 241-245. 1946.—The respiration of the wing and leg discs of wild type, miniature wing, and vestigial wing *Drosophila* was measured with the Cartesian diver ultramicrorespirometer. Their weights were measured by the quartz fiber balance of Lowry. At each of several stages studied, before, at, and after pupation, the Q<sub>O<sub>2</sub></sub> of wild type wing discs and the leg discs of all stocks used varied only slightly from 20 mm<sup>3</sup> O<sub>2</sub>/hr./mg. tissue. The Q<sub>O<sub>2</sub></sub> of miniature wing discs was 18 mm<sup>3</sup> O<sub>2</sub>/hr./mg./tissue and of vestigial wing discs 9 mm<sup>3</sup> O<sub>2</sub>/hr./mg. The wts. of vestigial, miniature and normal wing discs are the same at corresponding developmental stages in the larvae and 1- or 2-hr. pupae, although the adult wings are of different sizes. Both the

wts. of the wing discs and the rate of O<sub>2</sub> consumption per disc increase sharply just before pupation. The mutant genes, vestigial and miniature, produce their effects by altering the rate of some chemical reaction in the wing disc which is reflected by a lowered rate of O<sub>2</sub> consumption. It is interesting to note that the metabolism of the leg and probably of other discs is not changed although the cells contain the mutant genes. These genes, therefore, produce their physiological as well as their morphological effects only in certain cells of the body, presumably by the interaction of the gene or gene products with specific components of the cytoplasm of those cells.—*C. A. Villee.*

5187. Waters, Nelson F. (*U. S. Region. Poultry Res. Lab., East Lansing, Mich.*) The occurrence of lymphoid tumors in resistant and susceptible chickens. *Jour. Heredity* 37(9): 281-283. 1 fig. 1946.—Two pedigrees are given showing the incidence of naturally occurring lymphoid tumors, characterizing lymphomatosis, found within resistant and susceptible families of inbred White Leghorn chickens. All of the chickens in this study, both resistant and susceptible, were incubated and hatched together. Further, the chickens were reared as a mixed population throughout the entire exptl. period. The data, collected over a period of 7 yrs., show that genetic selection has reduced the incidence of tumors in certain families, while in other families the incidence of tumors has increased.—*N. F. Waters.*

5188. Whiting, Anna R., and H. C. George. Contrasts between visible and dominant lethal mutation rates in x-rayed *Habrobracon* eggs. *Biol. Bull.* 91(2): 214. 1946.—An abstract.

5189. Whiting, P. W., and Rudolph G. Schneider. Reproductive economy in close-crossed species with haploid males. *Biol. Bull.* 91(2): 218. 1946.—In the wasp *Melittobia*, >90% of the eggs from close crosses, incl. self crosses (mother × haploid son), may develop into ♀♀.

#### MAN

5190. Boas, Norman F., and William B. Ober. (*Massachusetts Gen. Hosp., Boston*.) Hereditary exophthalmic goitre. Report of eleven cases in one family. *Jour. Clin. Endocrinol.* 6(8): 575-588. 1 fig. 1946.—A family with 143 members in 5 generations is presented. 11 members had exophthalmic goitre and one each had primary hypothyroidism and a non-toxic thyroid adenoma. One patient with exophthalmic goitre developed Addison's disease and another diabetes mellitus. The exophthalmic goitre was seen in 2 consecutive generations (II and III). In generation II, 3 out of 6 siblings had the disease. One of these had 12 children, 6 of whom developed exophthalmic goitre. 2 more cases were seen in children of a normal and another thyrotoxic sibling in generation II. Case histories and a genealogical chart are submitted. Exophthalmic goitre is inheritable but evidence is too meagre to warrant any conclusions in regard to the mechanism of heredity. The incidence of other hereditary diseases in this family was no greater than seen in normal population.—*N. F. Boas.*

5191. Fawdry, A. L. Cooley's anaemia: Notes on six adult cases. *Trans. Roy. Soc. Trop. Med. and Hyg.* 40(1): 87-91. 1946.—Recent work has shown that the fatal familial blood dyscrasia first described by Cooley is transmitted by "carriers" as a Mendelian dominant. It is mainly confined to families of Greek and Italian origin. Six cases of "carriers" among the inhabitants of Cyprus are here reported and the clinical findings discussed in detail. Such "carriers" may show a great variety of symptoms—some being almost too slight to be recognized, while others may be of extreme severity. No genetic analysis of the pattern of inheritance is given.—*A. C. Wallon.*

5192. Følling, Asbjørn, Otto L. Mohr, and Lars Ruud. Oligophrenia phenylpyruvica. A recessive syndrome in man. *Skrifter Norske Vidensk.-Akad. Oslo, Matem.-Naturvidenskap Kl.* 1944(13): 1944.—Among 2402 mentally defective patients in Norwegian institutions, 34 were found to suffer from oligophrenia phenylpyruvica. The 34 include the 10 previously reported by Følling. Of the 34 cases, 19 were ♀ and 15 ♂. The 34 affected individuals were found in 22 fraternities. 11 gave evidence of a familial tendency. The hypothesis that an autosomal recessive gene is responsible is supported. It is emphasized that in addition to phenyl-

pyruvic acid in the urine, the most constant features present in affected individuals are light hair and blue eyes. The chemical transformations involved in the physiological actions of the gene are briefly discussed.—*H. H. Strandskov.*

5193. Hanhart, E. *Ergebnisse des Erforschung von Erbkrankheiten und Missbildungen in der Schweiz.* [Results of the investigation of hereditary diseases and malformations in Switzerland.] *Arch. Julius Klaus-Stift.* 18(3/4): 632-659. 10 fig. 1943.—Further evidence is presented of inheritance of many human diseases and abnormalities in Switzerland, of which only a few can be referred to here. The 3-yr.-old daughter of a woman transmitting haemophilia bled to death, confirming that a heterozygous ♀ occasionally has the symptoms. Several women conductors showed bleeding symptoms. A case is cited of reverse mutation from deuteranomaly to normal color vision. The combination of arachnodactyly with Ectopia lentis is ascribed to a deficiency of the connective tissue. Spherical lens with brachydactyly is probably the homozygous condition of the same gene. Spondylolithiasis of light degree was found in mother and daughter, a severe form in three children of a relative. Studies of myotonic dystrophy with cataract give further evidence of anticipation or earlier development in later generations. A case of muscular dystrophy is described intermediate between the infantile Werdnig-Hoffman and the adult Duchenne type. A non-Jewish peasant family showed 8 cases of infantile amaurotic idiocy in 3 sibships. Recessive dysostosis multiplex showed 5 cases in 3 sibships of a family, but the 3 mothers were dwarfs with hypertelorism and various other abnormalities. This condition may be allelic to Morquio's disease or both may represent the same gene. One of the pedigrees shows a family with 10 cases (5♂, 5♀) of recessive microcephaly. However, there is evidence against the view that severe feeble-mindedness is recessive and a mild degree dominant.—*R. R. Gates.*

5194. Ludwig, W., und Ch. Boost. *Über das Geschlechtsverhältnis beim Menschen. III. Die Ursachen der männlichen Mehrsterblichkeit und ihre Beziehungen zur*

*Variabilität der Geschlechtsverhältnisse.* [Sex ratio in man. III. Causes of the greater mortality of males and its relations to variability of the sex ratio.] *Biol. Gen. [Vienna]* 16(1/3): 160-197. 2 fig. 1942.—In man and certain mammals the sex ratio ♂:♀ of embryos immediately after conception is >1.25. This ♂ "plus conception" is afterwards compensated by a corresponding ♂ "plus mortality". If the latter were merely a consequence of recessive totally sex-linked lethal factors (Lenz's hypothesis), man's X chromosome would have to have a total rate, for mutation steps normal → lethal, of >10% which would be 10 times stronger than the average of other characteristics genetically well studied. The authors suppose, therefore, in agreement with Holmes (1926), that the ♂ plus mortality is conditioned by lethal factors to only a minor degree, and is mostly due to "constitutional weakness" of the ♂ embryos. They believe that of the 2 phenomena of "♂ plus conception" and "♂ plus mortality", the latter (by "constitutional weakness") is the primary one. Some related phenomena are discussed.—*Max Onno.*

5195. Penrose, L. S. (*Galton Lab., London, Eng.*) *Inheritance of zygodactyly.* *Jour. Heredity* 37(9): 285-287. 1946.—The material from published pedigrees of zygodactyly has been analyzed and it has been shown that paternal hereditary influence predominates over maternal. The phenomenon is interpreted as evidence that the trait is primarily due to incompatibility of the mother with some unknown fetal antigen inherited from the father.—*Auth. abst.*

5196. Stauffer, J., and T. J. Moffett. (*Colgate U., Hamilton, N. Y.*) *A pedigree of rheumatoid spondylitis.* *Jour. Heredity* 37(9): 287-288. 1 fig. 1946.—A pedigree of rheumatoid spondylitis (Marie-Strumpell's disease) is presented, in which there is an affected ♂ in direct descent in each of 3 successive generations. Since the disease is relatively rare, it is unlikely that chance alone is responsible for its incidence in this family. It seems probable that genic action is one of the chief variables in its expression in this pedigree and a dominant gene appears to be involved, with low penetrance in ♀♀.—*J. Stauffer.*

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 5103, 5396, 5397, 6105, 6106, 6107, 6108, 6109, 6110, 6111, 6112, 7062, 7537, 7598, 7605, 7618)

### MICROSCOPY AND TECHNIQUE

5197. Bennett, A. H. Phase microscopy, its development and utility. *Sci. Month.* 63(3): 191-193. 2 fig. 1946.—A microscope whose condenser contains an opaque diaphragm with an annular opening, with an objective containing a diffraction plate of dielectric materials or metals, of a pattern corresponding to the diaphragm and located at or near the 2d focal plane is useful in examining materials having little optical contrast while differing from their surroundings in refractive index or actual thickness.—*H. F. Copeland.*

5198. Zuckerman, Samuel, and Louis Koch. (*H. Kohnstamm and Co., Brooklyn, N. Y.*) Solubility of FD and C Red No. 3 in water. *Jour. Assoc. Offic. Agric. Chem.* 29(3): 307-310. 1 fig. 1946.—A method for determining the maximum solubility of the dye has been developed, and the extension of the procedure to include all of the water-soluble FD and C colors is contemplated. The method consists essentially in plotting the wt. of solute, taken as abscissa, against the % (on a wt.-wt. basis) of dye, in the filtrate, as ordinate.—*J. E. Webster.*

### LABORATORY APPARATUS AND TECHNIQUE

5199. Cantino, E. C., and E. D. Hatfield. (*U. California, Berkeley.*) Semi-continuous tap-water aerator. *Science* 103(2664): 75-76. 1 fig. 1946.—Operated by tap water, and utilizing only common laboratory glassware items.—*M. A. Raines.*

5200. Clark, Walter S. (*Duke U., Durham, N. C.*) A simple automatic pressure-regulating device for use with vacuum lines. *Science* 103(2666): 145-146. 2 fig. 1946.

5201. Conn, H. J., and Elmer Stotz. (*Agric. Expt. Sta., Geneva, N. Y.*) Comparative absorption readings obtained with spectrophotometers of various types. *Stain Technol.* 21(2): 49-54. 1946.—A comparison of the absorption

curves, characteristic for various dyes, obtained with a visual type spectrophotometer is made with curves obtained with a photo-electric spectrophotometer.—*E. R. Noble.*

5202. Culbertson, C. G. (*Indiana U. Med. Center, Indianapolis.*) A simple sharpener for microtome blades. *Jour. Clin. Path. Tech. Sect.* 10(3): 97-100. 2 fig. 1946.—A photograph of the assembled device is given showing the position of the knife and method of holding it. Three photomicrographs show the knife edge, magnified about 150 times, during the sharpening process. The materials required for the sharpener are explicitly described with exact measurements and specific directions for assembling.

5203. Gohde, Gerhard. [Simplified fluorescent microscopy with a new lighting apparatus.] *Zentralbl. Bakt. I. Abt. Orig.* 151(2): 158-160. 1944.—In collaboration with Dr. Krefft the author built a mercury high compression lamp. The essential part is a small discharge vessel of quartz which is built in a larger glass recipient, which passes u.-v. rays of 3000 Å. The lamp can be used on an alternating current (220 Volt tension) with a resistance. It is fixed in an ordinary lampholder. A special lighting gas and a special activator of the electrodes are used. After 1½ minutes, when the lamp is hot, the full light is developed, which does not flicker. The lamp was sold by Osram, Berlin.—*A. C. Ruys.*

5204. Loeb, Leonard B. (*U. California.*) The basic mechanisms of static electrification. *Science* 102(2658): 573-576. 1945.—Static electrification is caused by at least 5 basic mechanisms: (1) electrolytic effects, (2) contact or Volta electrification, (3) spray electrification, (4) frictional electrification and (5) mechanical separation of ions and electrons created by elect. phenomena in gases or in flames. It must be realized that 2 or more of these mechanisms may be involved in a given activity.—*H. M. Kaplan.*

5205. Pauling, Linus, Reuben E. Wood, and J. H.

**Sturdivant.** (*California Inst. Tech., Pasadena.*) An instrument for determining the partial pressure of oxygen in a gas. *Science* 103(2672): 338. 1946.—Operation of the instrument depends upon the fact that the magnetic susceptibility of  $O_2$  is very much greater than that of any other common gas. The indication of the magnetic susceptibility of the gas in the test chamber of the meter depends upon the behavior of a small test body surrounded by the gas in an inhomogeneous magnetic field; the force on the test body due to the magnetic field is proportional to the difference in volume magnetic susceptibility of the test body and the gas surrounding it. The test body in the meter is a small dumbbell consisting of 2 small glass spheres about 3 mm. in diam. connected by a small glass rod or tube about 4 mm. long. This dumbbell, which weighs about 2 mg., is cemented, together with a small mirror, to a silica fiber about 3  $\mu$  in diam. and about 10 mm. long which is stretched across a silica fork. By rotating around the silica fiber, which serves as a torsion balance, the spheres of the dumbbell may move in an inhomogeneous magnetic field which is produced by permanent magnets with suitably shaped soft iron pole pieces. The magnetic susceptibility of the gas in the chamber (with gas volume about 4 ml.) surrounding the test body may be indicated on a scale by a beam of light reflected from the small mirror.—*M. A. Raines.*

**5206. Pizer, N. H.** (*South-Eastern Agric. Coll., Wye, Ashford, Kent.*) Note on setting a new lamp in the Spekker photo-electric absorptiometer. *Chem. and Indust. [London]* 1946(1): 5. 1946.—Concentric rings are drawn on a disc of white cardboard, which is cut to fit inside the lens holder on the right hand side of the instrument. With the drum set at zero, the position of the lamp is adjusted until the beam of light is central on the disc.—*W. M. Holman.*

**5207. Rilett, R. Omar.** (*U. Wisconsin, Madison.*) Desiccators as constant humidity chambers. *Jour. Econ. Ent.* 39(3): 385. 1 fig. 1946.—Directions for the construction of apparatus for temp.-humidity studies on *Laemophloeus ferrugineus* are given. The equipment should prove of equal value for similar studies on other species of animals.—*R. O. Rilett.*

**5208. Sanders, A. G.** (*Sir William Dunn Sch. Path., Oxford, England.*) Nouveaux appareils pour les micromanipulations. *Brit. Med. Bull.* 4(1): 72. 1946.—The laboratory of cinemicrography of the Pasteur Inst. of Paris is at Garches, well away from the vibrations of the city. Here Drs. Comandon and de Fonbrune have developed the technic of microdissection and micromanipulation to a very high degree, making possible the extraordinary microbiological films which they have produced. Extremely fine micropipettes, needles, scalpels, hooks and other tools used for the delicate operations performed are made under direct microscopical observation with an apparatus called the "microforge". Most of the instruments are made of pyrex glass. Heat is supplied by a V-shaped platinum-iridium filament which can be electrically heated to any desired degree. Cooling, if needed, is also under exact control. An elaborate micromanipulator for these exceptionally fine instruments has complex levers moved by alteration of air pressure within sensitive metal tambours. The prepn. and manipulation of the instruments has been recorded in a remarkable cinemicrograph film, one of 4 described by Dr. Sanders who is himself an expert in making films for exptl. pathology.

**5209. Anonymous.** Relay for high speed operation. *Indust. Equip. News* 13(12): 5. 1 fig. 1945.—Armature and contacts sealed in glass. Capable of operating speeds to 1,000 per sec. Sensitive to .5 milliwatt. Available in contact ratings to 5 amp. on 115-volt ac. Source: Stevens-Arnold Co., 20 Elkins St., S. Boston, Mass.—*M. A. Raines.*

**5210. Anonymous.** Poly-phosphate comparator. *Indust. Equip. News* 13(12): 52. 1 fig. 1945.—Provides readings on low concs. of poly-phosphates such as hexameta, pyro, septa. Following conversion of a sample, reagents are added separately and the blue color formed is compared with standards supplied for this purpose, to provide a reading of total phosphate content. A detn. on a cold sample provides a reading of the ortho in the sample, and the difference between the 2 readings represents the poly-phosphate. Equipment includes a comparison block containing 8 standards between 0 and 10 ppm. Source: W. A. Taylor & Co., 7302 York Road, Baltimore 4, Md.—*M. A. Raines.*

**5211. Anonymous.** Water testing set. *Indust. Equip. News* 13(12): 54. 1 fig. 1945.—A new simplified assembly of apparatus and reagents, in suitable cabinet, to perform hardness and alkalinity tests on water and to make chloride determinations. Additional apparatus also is available, and can be fitted into the cabinet without alteration, to add tests for pH and phosphate. Source: Trutest Laboratories, 259 South 3rd St., Philadelphia 6, Pa.—*M. A. Raines.*

**5212. Anonymous.** Water testing set. *Indust. Equip. News* 13(12): 59. 1 fig. 1945.—Slide-comparator type, for checking nitrate ion in water. Standards cover the range between 0 and 100 ppm. of nitrate in 9 graduations. Source: W. H. & L. D. Betz, Worth & Gillingham, Philadelphia 24, Pa.—*M. A. Raines.*

**5213. Anonymous.** Electronic meter. *Indust. Equip. News* 13(12): 61. 1 fig. 1945.—New design of the R.C.A. Co.'s No. 195-A "Voltomyst" electronic meter provides ac. and dc. voltage readings in 6 ranges between 0 and 1,000 volts. It reads as an ohmmeter, with an internal source of 3 volts, in 6 ranges, minimum at 0 to 1,000 ohms, maximum at 0 to 1,000 megohms. It measures a-f. and supersonic voltage to 100 volts and a range of 30 to 100,000 cycles. It reads decibels based on a-f. voltage calibrated equivalent to volume units for direct readings across a 600-ohm audio circuit with standard zero level of 1 mw. It serves as an fm. indicator to measure discriminator voltage alignment, indicating positive or negative deviation on the two sides of the central balance point. The instrument operates on 110-volts 50/60-cycle ac. Source: R.C.A. Mfg. Co., 1941 Front and Cooper Sts., Camden, N. J.—*M. A. Raines.*

**5214. Anonymous.** Laboratory rectifier. *Indust. Equip. News* 13(12): 62. 1 fig. 1945.—Variable voltage unit, supplies regulated dc. output at 125 ma. on continuously variable voltage from 0 to 325 volts. It is also center tapped for ac. output at 6 amp. and 6.3 volts. Operation is on 105 to 125-volt 50/60-cycle ac. Regulation on the dc. output is within 1% between 23 and 325 volts from no load to full load; it is within 2% at 10 volts. Source: Electronic Measurements Co., 8 West Front St., Red Bank, N. J.—*M. A. Raines.*

**5215. Anonymous.** Electronic tachometer. *Indust. Equip. News* 13(12): 75. 1 fig. 1945.—A combination of a frequency meter for ranges to 50 kc. and a stand-mounted light source and photoelectric cell serves to make readings of rotative speeds over a practically unlimited range. Source: Hewlett-Packard Co., 483 Page Mill Road, Palo Alto, Calif.—*M. A. Raines.*

**5216. Anonymous.** Radioactivity R-Meter. *Indust. Equip. News* 13(12): 108. 1 fig. 1945.—Consists of an adjustable power supply, an electronic microammeter and a means to hold material in which any radiation is to be detected. The meter is calibrated to read in "R" units in an over-all range of .000001 to 20R. The power supply, operating from a 115-volt 60-cycle ac. source, provides dc. from 100 to 2,000 volts. Source: Rowe Radio Research Laboratory Co., 2420 N. Pulaski Rd., Chicago 39, Ill.—*M. A. Raines.*

**5217. Anonymous.** Rectifier. *Indust. Equip. News* 14(1): 15. 1 fig. 1946.—Output ratings, 1 to 7 amperes. Characterized by ability to compensate instantly and hold voltage constant in rapid current-load fluctuations. Employs a circuit that also compensates for normal variation in the ac. supply voltage. Source: W. Green Electric Co., 128 Cedar St., New York 6, N. Y.—*M. A. Raines.*

**5218. Anonymous.** Cathode-ray tube. *Indust. Equip. News* 14(1): 21. 1 fig. 1946.—Employs a double beam to converge superimposed traces on a single screen for simultaneous comparison of 2 phenomena. Source: Allen B. Du Mont Laboratories, Inc., 4 Main St., Passaic, N. J.—*M. A. Raines.*

**5219. Anonymous.** Vacuum sealed resistor. *Indust. Equip. News* 14(1): 31. 1 fig. 1946.—For use in electrometer circuits. Suited for precision operation in a range of 10 millivolts to 10 volts; resistance value is 1 to 1,000,000 megohms. Source: Victoreen Instrument Co., 5804 Hough Ave., Cleveland, Ohio.—*M. A. Raines.*

**5220. Anonymous.** Gauss meter. *Indust. Equip. News* 14(1): 56. 1 fig. 1946.—With 5 scale ranges, 100 to 5,000 gauss, to check flux distribution in a magnet. Source: General Electric Co., Dept. 6X-201, Schenectady 5, N. Y.—*M. A. Raines.*



**5221. Anonymous. Voltage regulator.** *Indust. Equip. News* 14(1): 67. 1 fig. 1946.—Has an adjustable voltage range between 0 and 130 volts, with an output rating of 5 amp. The voltage is adjustable in 0.1-volt steps. Source: Sorensen Co., Union Bldg., Stamford, Conn.—*M. A. Raines.*

**5222. Anonymous. pH testing papers.** *Indust. Equip. News* 14(1): 73. 1 fig. 1946.—The R. P. Cargille Co. has added 6 new short-range pH papers to its "Hydriion" line to read in 0.25-pH steps by color comparison, over a total range of 1 to 14 pH. Source: R. P. Cargille Co., 116 Liberty St., New York 6, N. Y.—*M. A. Raines.*

**5223. Anonymous. Heat dissipating equipment.** *Indust. Equip. News* 14(1): 101. 1 fig. 1946.—For cooling requirements of electrical equipment such as mercury lamps, X-ray tubes, in which a fluid can be pumped through suitable jackets surrounding the apparatus. The assembly includes a motor that drives a centrifugal pump and fan, a cooling coil, thermostatic flow equipment, a fluid reservoir, and circulating connections leading to the fluid jacket on the equipment. Temp. of the equipment maintained to within 2°C. Source: Eastern Engineering Co., 73 Fox St., New Haven 6, Conn.—*M. A. Raines.*

**5224. Anonymous. Miniature electronic tube.** *Indust. Equip. News* 14(2): 19. 1 fig. 1946.—With overall dimensions of  $1\frac{1}{16}$  in. in length, 0.4 in. in width, and 0.3 in. in depth. Includes 4 types: a shielded rf. pentode amplifier, a triode-heptode converter, a diode-pentode detector-amplifier, and an output pentode for earphone operation. Source: Raytheon Mfg. Co., 1946 Chapel St., Newton 58, Mass.—*M. A. Raines.*

**5225. Anonymous. Electronic thickness gage.** *Indust. Equip. News* 14(2): 23. 1 fig. 1946.—New "Filmeter" measures quickly and non-destructively the thickness of films of materials such as paint, varnish, lacquer, ceramics, plastics, that have been applied on non-magnetic base metals such as aluminum, brass, copper, bronze, providing there is not more than a 6-in. radius in surface curvature. Minimum thickness of the base metal on which measurement can be made is 0.011 in. for aluminum or copper, 0.02 in. for brass or bronze. There is no limit to maximum thickness of the metal. Housing dimensions of the instrument are 7 × 7 × 7 inches. Instrument wt. is 11 pounds. Accuracy of reading is within 3% of full scale. Source: American Instrument Co., Silver Spring, Md.—*M. A. Raines.*

**5226. Anonymous. Mirror.** *Indust. Equip. News* 14(2): 52. 1946.—Announces the development of a new mirror construction in which the silvered glass surface is sealed under a layer of plastic in laminated construction. This arrangement protects the reflecting surface, and adds strength that permits the use of thin glass. The mirror is available in single and double-face assemblies in sizes and thickness to specification. Source: Safetee Glass Co., 4715 Stenton Ave., Philadelphia 44, Pa.—*M. A. Raines.*

**5227. Anonymous. Testing electric switch for wave form, phase, and frequency study.** *Indust. Equip. News* 14(2): 75. 1 fig. 1946.—Will show 2 or more independent signals for comparison on the screen of a single cathode-ray oscilloscope; 3 circuits can be studied at one time by applying 2 of the units in cascade. Sweep frequency range is 10 to 12,000 cps. Amplifier frequency response is 4 cps. to 450 kc. flat within 3 db. Operation is on 110-volt 50-60-cycle ac. Maximum signal input is 250 rms. The instrument is suited for electrical studies of wave form, phase, frequency relationship, amplitudes, such as are of interest in the study of mechanical vibrations, sound, light, and other variables that can be transferred into electrical functions. Source: General Electric Co., Dept. 6X-201, Schenectady 5, N. Y.—*M. A. Raines.*

**5228. Anonymous. Testing video amplifiers to view complex waves in the oscilloscope.** *Indust. Equip. News* 14(2): 79. 1 fig. 1946.—A video amplifier, to view complex wave forms in an oscilloscope. Operates on 110-volt 60-cycle ac., with power consumption of 100 watts. Test input is normally through a probe, which has an attenuation of 10X. Direct input without the probe is approx. 212 megohms of resistance in parallel with 40 mmfd., which compares with 1.1 megohm in parallel with 18 mmfd. when the probe is used. Output voltage can be adjusted from 0 to 50 volts rms. with sine wave signals. Ripple output is under 0.5 volt. Frequency response is flat within 1.5 db. of the 10-

kc. response from 15 cycles to 4 megacycles. Phase shift is reduced to a minimum for satisfactory reproduction of pulses on the order of 1 microsecond and square waves at repetition rates down to 100 per second. Source: United Cinephone Corp., 63 New Litchfield St., Torrington, Conn.—*M. A. Raines.*

**5229. Anonymous. Timer.** *Indust. Equip. News* 14(2): 81. 1 fig. 1946.—Electronic interval unit, for 1 second increments, to 120 seconds. Source: Electronic Controls, Inc., 42 Summer Ave., Newark 4, N. J.—*M. A. Raines.*

**5230. Anonymous. Precision tuning fork.** *Indust. Equip. News* 14(2): 107. 1 fig. 1946.—For geophysical exploration, rating clocks and watches, synchronizing transmitters and receivers in communicating equipment, time-keeping, and chronographic work. Frequency stability is within 0.001%, or approx. one second per day. Source: General Radio Co., 273 Massachusetts Ave., Cambridge 39, Mass.—*M. A. Raines.*

**5231. Anonymous. Ionization vacuum gage unit.** *Indust. Equip. News* 14(8): 16. 1 fig. 1946.—For sensitive readings of high vacuum. The operating element is enclosed in an envelope made of Nonex glass measuring  $2\frac{1}{2}$  in. in outside diam. This envelope is integral with a Nonex glass connecting tube for application in the vacuum circuit. Filament and grid are both tungsten. Maximum operating pressure base on air is  $1\ \mu$  of mercury. Sensitivity at 5 ma. emission current is 100 microamperes per  $\mu$  of dry air. Maximum emission current is 25 ma. Source: National Research Corp., 98 Brookline Ave., Boston 15, Mass.—*M. A. Raines.*

**5232. Anonymous. Electronic vacuum gage.** *Indust. Equip. News* 14(8): 24. 1 fig. 1946.—Indicates vacuum to  $10^{-7}$  mm. mercury. Consists of a gage tube and control unit to provide continuous indication of vacuum directly in millimeters of mercury. The gage tube is a special glass triode arranged for connection to the vacuum to be measured by sealing in place. It connects electrically to the control unit, which includes an emission regulator circuit, stabilized voltage supply, an electronic microammeter with an indicating instrument, and a filament-protecting relay. Source: General Electric Co., Dept. 6X-201, Schenectady 5, N. Y.—*M. A. Raines.*

**5233. Anonymous. Electronic servo unit.** *Indust. Equip. News* 14(8): 47. 1 fig. 1946.—A very sensitive instrument which can be actuated by extremely small forces such as the movement of an electric meter, pressure or flow gage, a silk filament, weighing balance, air vane, metal bellows, magnetic compass needle. Acts through an assembly of miniature electronic tubes contained in a separate housing to control speed and direction of a standard  $\frac{1}{16}$ -hp. induction motor which, in turn, can actuate any device or mechanism requiring not more than 30 to 75 in. lb. of torque. Source: W. C. Robinette Co., 800 Fair Oaks Ave., South Pasadena, Calif.—*M. A. Raines.*

**5234. Anonymous. Oscilloscope.** *Indust. Equip. News* 14(8): 51. 1 fig. 1946.—The assembly includes a cathode-ray tube, vertical and horizontal amplifiers, linear time-base oscillator, means for synchronization, and a self-contained power supply. Produces a linear trace from 10 cycles to 50 kilocycles. Synchronization with low voltages is possible in the audio, supersonic and low rf. ranges. Source: Waterman Products Co., 2473 Emerald St., Philadelphia 25, Pa.—*M. A. Raines.*

**5235. Anonymous. Photoelectric lighting control.** *Indust. Equip. News* 14(8): 53. 1 fig. 1946.—Designed for turning street lighting lamps on and off. It closes the lamp circuit at any preset value between  $\frac{1}{2}$  and 6 foot-candles in north-sky illumination; opens the circuit when light intensity reaches 2 foot-candles more than the turn-on value. Source: Fisher-Pierce Co., 80 Ceylon St., Boston 21, Mass.—*M. A. Raines.*

**5236. Anonymous. Radiation meter.** *Indust. Equip. News* 14(8): 94. 1 fig. 1946.—"Vest-pocket size," with wavelength range 0.3 to 3.5  $\mu$ . Consists of a thermocouple radiation receiver assembled in a metal enclosure in the housing top, and a D'Arsonval type indicating instrument which is connected to the receiver leads. This instrument is a permanent-magnet moving coil millivoltmeter with a  $1\frac{1}{2}$  in. scale, providing a range of 0 to 2 gram-calories per sq. in. per minute. Source: General Electric Co., Dept. 6X-201, Schenectady 5, N. Y.—*M. A. Raines.*

## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Hemoglobin levels in race, age and sex groups, N. Carolina, 5433; Origin of obliquely contracted pelvis, 5639; Development during first year of life, 5824; Biol. and med. studies at Fels Res. Inst., 5835; Cranial characters in *Cercopithecus* and *Macaca*, 6089; Dispersal of plants assoc. with Buddhism, 6615)

5243. Brown, A., and R. K. Harper. (*Roy. Infirm., Glasgow, Scotland.*) Craniofacial dysostosis: The significance of ocular hypertelorism. *Quart. Jour. Med.* 15(59): 171-183. 10 fig. 1946.—The clinical and radiological features in 5 cases of ocular hypertelorism (a craniofacial deformity associated with undue separation of the orbits) are described, and available literature reviewed. The cases were observed in 2 families. In the 1st family the deformity resembled in part that described by Greig in 1924; in the 2d it was associated with oxycephaly. Although there is in the literature on hypertelorism a tendency to accept the ocular defect as the fundamental abnormality, it is evident from the cases reviewed and those herein described that undue separation of the orbits may reflect one of several basic changes. Ocular hypertelorism is a descriptive term without etiological implications and may occur with any type of craniofacial dysostosis. It is evident in infancy and persists throughout life. Most affected subjects have strabismus, defective visual fields and defective binocular vision, while 1 in 5 have definite mental defects, not always related to the degree of the deformity, and half the cases have some additional physical defect. The etiology of the various craniofacial dysostoses is unknown. Premature closure of sutures may be responsible, but this is not always demonstrable by radiology. The 1st of the 2 families studied consisted of father, mother and 5 children, 4 girls and a boy. The father and the 1st and 4th children were affected, as had been the father's mother. This prolific family had a high mortality at an early age. Of at least 55 persons in 2 generations, only 20 reached adult life. There was no history of consanguineous marriage. In the 2d family 3 members belonging to 3 generations were affected. Only 2 were examined. The father's mother had been the first case noted. Here too there was no history of consanguineous marriage.—*B. C. Russum.*

5244. Clark, W. E. Le Gros. Immediate problems of human paleontology. *Man* 46(72): 80-84. 1946.—This is a summarizing article. Clark feels that Neanderthal was a collateral form in human evolution, though he stresses the need to know Neanderthal variability in greater detail. Swanscombe hints that *Homo sapiens* is very ancient. It is suggested that *Pithecanthropus erectus* and *P. pekinensis* are acceptable terms. The long bones of these forms demonstrate that limbs went ahead of cranio-cerebral evolution. The S. African "man-apes" are anthropoid in the skull, hominid in the dentition. There are 25-30 spp. of *Dryopithecus*, all or most of them ancestral to the anthropoids. Two new genera of fossil apes, *Bramapithecus* and *Ramapithecus*, may be ancestral to *Homo*. They appear to link *Dryopithecus* and *Australopithecus*. Clark also comments on the paleontology of the human brain and upon Pleistocene chronology. He urges coordinated and adequately supported researches in human paleontology.—*W. M. Krogman.*

5245. d'Avila, Bastos. Alguns dados de cefalometria no escolar. [Some craniometric data on school children.] *Arq. Mus. Nacion. Rio de Janeiro* 37: 289-329. 1943.—The data cover 1366 to 1710 children of both sexes, ranging from 6-7 yrs. to 14-15 yrs. The data (sexes separate) are rendered in terms of age-class means, and the over-all means with probable errors are calculated. Cranial quantities: circumference, max. length and breadth, auricular height, nasion-vertex projected length, horizontal and vertical cephalic indices, cranial capacity, Dubois' cephalization coeff. Facial quantities: Morph. height, bizygomatic diam., morph. index, internal and external biorbital diams., biorbital index, nasal height, breadth and index, subnasale-gnathion height, max. buccal diam., bilabial height, buccal index, auricular height, breadth and index. Separate tables are given for prevalently Negroid children.—*E. W. Count.*

5246. Glob, P. V. Eskimo settlements in northeast Greenland. *Meddelelser om Grønland* 144(6): 1-40. 9 maps. 1946.—In Greenland from about 70° N. lat. and northwards, 215 localities are known with traces of former Eskimo

habitation. These are shown on the maps, and listed with a brief statement of the type of settlement found, and the ref. to the original report of the find, for each. The purpose of this list is to gather up the many, scattered refs. contained in numerous expedition reports and special publications, to obtain a survey of what is known, as a basis for planning future archaeological work. These localities include 103 summer camps with tent rings, 39 winter settlements with house ruins alone, 61 settlements with both winter houses and tent rings, and 12 hunting camps with shelters, meat caches, and the like. The large camps were doubtless connected with whaling. A few living Eskimos were seen in this region in 1823, but never since. Probably destruction of the whales by European hunters destroyed their source of livelihood.

5247. Kidd, C. E. The skull of a Copper Eskimo. *Man* 46(1): 1-2. 1946.—The author reports the study of a single adult ♂ Copper Eskimo skull (without mandible) from Coronation Gulf. Since its muscle attachments are slight and the teeth are not worn, its owner in life is considered to have been a "weakling." Pertinent dimensions are as follows: cc. = 1410; L = 175; B = 134; H = 133; Face B = 129; upper face H = 71.5; NH = 56; NB = 22; Orb. B = 37; Orb. H = 37; CI = 76.5; L-H index = 76.0; upper FI = 55.4; OI = 100.0; NI = 39.3.—*W. M. Krogman.*

5248. Krogman, W. M. (*U. Chicago.*) Whose skull is it? *Sci. Month.* 63(4): 315-316. 1946.—Careful anthropological measurements were made on the head of a cadaver; the skull was cleaned, and submitted, with data as to race, sex, and age, to an expert in reconstruction; who, with no further information as to the original face, modelled upon it a face recognizably the same as the original one.—*H. F. Cope-land.*

5249. Neumann, Georg. (*Indiana U., Bloomington.*) On the physical types of the Shoshonean-speaking tribes. *Proc. Indiana Acad. Sci.* 55: 26-28. 1946.—The Shoshonean-speaking tribes of the West do not represent a single physical type; at least 3 varieties—Margid, Centralid, and Pacifid—are represented. The southernmost and earliest are almost entirely Margid, the northernmost and latest immigrants predominantly Pacifid, while the Centralids represent shattered remnants in an intermediate area. The prehistoric skull from Catlow Cave No. 1 in Harney County, Oregon, can be classified as Margid; more recent series from the same region indicate the presence of Centralid and Pacifid elements.—*Georg Neumann.*

5250. Shock, N. W. (*Nat. Inst. Health, Bethesda, Md.*) Some physiological aspects of adolescence. *Texas Repts. Biol. and Med.* 4(3): 289-310. 1946.—In studies of adolescence at the U. of Cal., repeated measurements were made on a group of 50 boys and 50 girls, at 6 or 12 month intervals, over an age span of 11.5-18 yr. Many types of measurements were made, this paper being a description of the changes occurring in pulse rate and blood pressure, various determinations involving respiratory exchange and metabolism, and sex hormone excretion. Some of the physiological differences between the sexes were found to be present before adolescence, whereas others appeared at adolescence. Although the average curves give the impression of gradual changes, it is pointed out that the changes, as measured on individuals, were often rapid and abrupt. During adolescence there is a period of great variability in the factors studied, representing a period of difficult adjustment to an adult state. This period of instability is thought to give rise to many of the psychological problems of adolescent behavior.—*A. A. Ormsby.*

5251. Weiner, J. S. Some remarks on physiological anthropology. *Man* 46(76): 90-91. 1946.—The author points out that physical anthropologists have utilized morphology. He now suggests attention to physiology. He notes 2 basic reasons: 1) "the fundamental contribution which physiology can make by exploring the metabolic, chemical, and regulative processes which underlie the more obvious and well-established differences in morphology which

exist between groups of present-day man;" 2) the ecological approach, which would elucidate "the functional interrelation between man and his environment, natural or artificial." He stresses that the morphological approach is more or less static, i.e., the observation and classification of end-products. The physiological approach is dynamic, i.e., it is the analysis of bionatural causation in the unfolding of the processes that result in the adult human physique.—*W. M. Krogman.*

5252. Wells, L. H. (*U. Witwatersrand, Johannesburg, S. Africa.*) A further report on the Wonderwerk Cave, Kuruman. II. Fauna. *S. African Jour. Sci.* 40: 263-270.

1943.—Test excavations in beds with Late Stone Age artifacts gave numerous fragments of ostrich eggs, 2 spp. of *Equus*, one of *Phacochoerus* and 6 bovids (all extant). Other less critical collections, including possibly material from earlier beds, gave 22 mammals, including 2 extinct *Equus*.—*G. W. Sinclair.*

5253. Wells, L. H. (*U. Witwatersrand, Johannesburg, S. Africa.*) Marine animals in a rock painting near Fouriesburg, O. F. S. *S. African Jour. Sci.* 42: 236-239. 1946.—Prehistoric paintings, 200 miles from the sea, include figures of dolphin.—*G. W. Sinclair.*

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; Geriatrics; and: Oligophrenia phenylpyrouvica, 5192; Physiological aspects of adolescence, 5250; Hemoglobin levels in race, age and sex groups, N. Carolina, 5433; Nutritional status of Otomi Indians, Mexico, 5489; of poor families in a government-operated dining room, 5496; Food selection in New York cafeteria, survey, 5497; Studies on malnutrition, 5499, 5515, 5531; Role of chemistry in food management, 5501; Nutrition survey, rural Holland, 5510; Nutritional status of Japanese prisoners, 5513; Development in science of nutrition during World War II, 5514; Effects of slow starvation of British and Russian prisoners of war, 5517; of estrogens on the senile skin, 5816; Basic food supply in relation to human need, 5520; Source of nutrients in diet of village population, 5521; Problems of nutrition in Mexico, 5524; Food intake of college women, 5529; Artificial insemination, 5626; Impaired fertility in the male, 5627; Factors affecting birth wt., 5628; Breast vs. artificial feeding, 5633; Personality in arterial hypertension, 5676; Electrocardiography survey of 500 healthy negro and white adults, 5689; Hashish, 5801; Comparative chronol. age of man and other mammals 5815; Development during first year of life, 5824; Biol. and med. studies at Fels Res. Inst., 5836; Incidence of sickle-cell anemia in W. Africa, 5991; Hemophilia, 5993; Group psychotherapy of veterans, 6004; The surgery of peripheral nerve injury, 6005; Electroencephalography in psychopathology, 6027; Dental survey, Switzerland, 6068; Milk consumption and social status, 6159; Preventive medicine and public health, 6396; Public health program, U. S., 6399)

### POPULATION, FERTILITY, VITAL STATISTICS

5254. De, J. C. (*Med. Coll., Calcutta, India.*) Social security and national health service for India. *Calcutta Med. Jour.* 42(12): 271-274. 1945.—India has malnutrition to the point of starvation for thousands of destitutes, degrading living conditions conducive to the spread of epidemic diseases and millions of unemployed. De contrasts the infant mortality, medical and hosp. service, health officers, etc., in Gt. Britain and India. The Government must maintain a high and stable level of employment for the people. It must raise the standard of living. It must initiate and finance a comprehensive health service for the country.

5255. Mikkelsen, Ejnar, in collaboration with P. P. Sveistrup. The East Greenlanders' possibilities of existence, their production and consumption. *Meddelelser om Grønland* 1-244. 4 maps, 21 fig. 1944.—A comprehensive report, made possible by access to the accounts and records of the East Greenland stores, which were established by the Administration of Greenland, and through which passed the population's surplus production of hunting products and its total consumption of imported articles of food, clothing, and utensils. The various chapters discuss the living conditions in prehistoric times, the population of s.-e. Greenland at the beginning of historic times, the establishment of the Angmagssalik Settlement (in 1894), and detailed discussion of the changes in the pattern of living, food consumption, type of clothing, type of housing, and so on, which have developed during the 50 yrs. of the Greenland monopoly. The policy of the Danish government was always to try to administer the settlement for the benefit of the natives. Consumption of imported commodities has risen very considerably, with results often detrimental to the health of the natives, but it is a difficult problem to encourage more use of native products without seeming to infringe upon their rights. It is suggested that new trading posts and hunting grounds should be opened, and the population encouraged to spread farther along the coast, and that some international agreement with a view to preserving the stock of marine animals of capture would be necessary to safeguard the existence of the East Greenlanders. The population still is in need of protection against unchecked contact with hunters or tourists.

5256. Overholser, Winfred. (*Med. Sch., George Washington U., Washington, D. C.*) Mental hygiene. *Proc. Amer. Phil. Soc.* 90(4): 259-264. 1946.—Statistics are furnished the interpretation of which might be epitomized in the statement that over one-half of the hospital beds of the entire country are in mental institutions. Recent experiences of medical personnel in the armed forces have operated to focus

attention on mental and nervous instability. As time advances a larger percentage of the population will be in the group over 65 yrs. where there is an increase in the incidence of mental illness. The relationship between mental illness and delinquency is real. All of the above points to the need for more adequate treatment for the mentally ill and defective. Modern treatment along the lines of shock therapy, narco-synthesis, prefrontal leucotomy, vitamin therapy, and psychotherapy are described and evaluated. Suggestions are made for the removal of the mental hospitals from the province of the departments of public welfare to the departments of public health. Preventive measures are suggested in the fields of adult education, child guidance clinics, industrial psychiatry, and the development of psychosomatic medicine on the part of the general practitioner.—*P. S. Shokely.*

5257. Stearn, E. Wagner, and Allen E. Stearn. The effect of smallpox on the destiny of the Amerindian. 153p. Bruce Humphries, Inc.: Boston, 1945. Pr. \$2.50.—The book brings together source-records of smallpox incidence among the N. and S. American Indians from the 16th to the 20th centuries, and so provides a history of the disease. The early introduction of smallpox by whites and by negro slaves, the consequent decimation of the Indians and their reactions to the disease, the deliberate use of the disease by whites to exterminate the Indians, the effects of the early variolation and later vaccination down to the present are sketched. The statements are rendered precise with dates and figures, including 2 tables of vital statistics. There is a bibliography of 176 titles.—*E. W. Count.*

5258. Titmuss, R. M. Stillbirth and neonatal mortality. *Proc. Nutrition Soc. [Cambridge]* 2(1/2): 36-41. 1944.—The author analyzes stillbirth and neonatal mortality statistics for England and Wales for the 3 yrs., 1936-38, concludes that there is a considerable scope for improvement in this field. Out of nearly 2 million pregnancies, over one quarter million, or 1 in 8, did not result in a live child aged 1 yr. The figures are discussed under the following sub-headings: general trends, geographical distribution, town and country, distribution according to social class, classification of neonatal mortality, birth rank and interval, maternal age and plurality.—*R. Braude.*

### BEHAVIOR

5259. Rapaport, D., and R. Schafer. Manual of diagnostic psychological testing. II. Diagnostic testing of personality and ideational content. *Josiah Macy, Jr. Found. Publ. Rev. Ser.* 3(1): 1-100. 1946.—This volume is



a continuation of the Manual of Diagnostic Psychological Testing in which the use of the Word Association Test, the Rorschach Test, and the Thematic Apperception Test, is discussed with reference to the evaluation of the personality and ideational content. In each case the test is described, its administration is outlined, and the results obtained from testing the clinical and control subjects are presented. In the concluding chapter the problem of diagnosing with a battery of tests is considered. An index to Parts I and II of the Manual is appended.—*Frederick Sargent.*

#### BEHAVIOR—SPEECH DISORDERS

5260. Anderson, Jeanette O. (*Louisiana State U. University.*) Is is not the verb for aphasia. *Jour. Speech Disorders* 11(2): 135-138. 1946.—Some general notes concerning a complete study of 18 cases of aphasia. The following general inferences are made:—Any series of tests can serve only as a guide in testing aphasia; procedures must be adapted to each patient in terms of his abilities and disabilities after discriminating analyses of errors and successes. Ordinary tests of linguistic activities cannot be used successfully in the examination of aphasic patients for estimating re-educability. Skills depending upon the relearning or rerouting of motor patterns seem to be regained more easily than skills dependent upon sensory patterns. Motivation is strongest and progress most sure when therapeutic techniques are adapted to the patient's greatest interests and to his usual activities. The patient will usually possess one ability relatively stronger than his others; if this can be used as a leading device in arranging therapeutic methods, response to other stimuli seems to be strengthened. The most important single cause of success or failure in the linguistic re-training of aphasic patients is personal potential or the 'x-factor'.—*M. F. Palmer.*

5261. Bender, James F. (*Nat. Inst. Human Relations, N.Y.C.*) Do you know a dyslexiac? *Sci. Month.* 63(4): 299-304. 1946.—Dyslexia, an abnormal inability to read, occurs in 2 forms; developmental, when it is not a result of physical injury; and acquired, when it is. It is generally curable, but not by any general method, each case requiring individual expert psychological treatment.—*H. F. Copeland.*

5262. Carhart, Raymond. (*Northwestern U., Chicago.*) Speech reception in relation to pattern of pure tone loss. *Jour. Speech Disorders* 11(2): 97-108. 1946.—Five groups of cases were selected for this study. All were tested at the Aural Rehabilitation Unit of the Deshon General Hospital between Nov., 1944, and May, 1945. These were divided into 5 groups: Group 1, 50 cases having flat audiograms characterized by equal loss in all frequencies; Group 2, 50 cases having gradual high tone loss characterized by a progressively greater impairment for higher frequencies at a slope of 5 to 10 decibels per octave; Group 3, 32 cases having marked high tone loss characterized by progressively greater impairment for higher frequencies at a slope of 15 to 20 decibels per octave; Group 4, 50 cases having notched audiogram characterized by flat or gradual high tone loss to 2048 c.p.s. and a sharp increased notch beyond 2048 c.p.s.; Group 5, 50 cases having atypical audiograms characterized by irregularities and curve shapes which exclude from any major category. These cases were selected because the audiogram presented the best example of the types found in the hundreds of cases going through at that time. 100 cases were also selected completely at random and the cases were also studied as a general group. The 7 groups described were compared on the basis of 3 criteria of auditory acuity: namely, speech reception threshold; 'better ear' average for 512-2048 c.p.s.; and AMA percentage of loss measured. The data were treated by correlation methods and by analysis of variance. The following results and conclusions were obtained:—High positive correlation between speech reception and each of the 2 other criteria were found for all groups except those with marked high tone loss. Acuity for frequencies at the extremes of the audiometric test range is of minimal relationship to speech reception threshold. Patients with notches beyond 2048 c.p.s. cannot be differentiated on any important point from the group with flat losses. Group distributions for difference scores between speech reception threshold and pure tone average were not significantly differentiated except for cases of marked high tone loss. The latter showed a trend toward better score on speech reception than on pure tone average. The implication is that acuity

between 512 and 1024 c.p.s. is more closely related to speech reception than is acuity between 1024 and 2048 c.p.s. Marked high tone loss cases are differentiated by sufficient factors so that this group may be accepted as constituting a special clinical category. The AMA % method gives less numerical parallelism with the speech measure than does the 512-2048 c.p.s. average. This fact, plus the extra labor involved, makes the pure tone average a more useful clinical tool except for special purposes. No statistical reason emerged from this study for favoring a percentage score over a simple 'better ear' average.—*M. F. Palmer.*

5263. Carrell, James A. (*U. Washington, Seattle.*) State certification of speech correctionists. *Jour. Speech Disorders* 11(2): 91-95. 1946.—No state certificate for doing speech corrective work meets the requirements of the Association for adequate professional work in this field. The present certification practice falls far short of the minimum requirements of the American Speech Correction Association.—*M. F. Palmer.*

5264. Huber, Mary. (*New York U., N. Y. C.*) Linguistic problems of brain-injured servicemen. *Jour. Speech Disorders* 11(2): 143-147. 1946.—Linguistically handicapped brain-injured patients appear most often in the neurological wards of the various hospitals. The problem is usually called aphasia. Numerous cases are now receiving language re-education in the army general hospital program. In work at the Halloran General Hospital it was the custom to outline for each patient a variety of activities aside from the usual speech clinic program to facilitate language development, such as attending the news center daily, seeing all the movies, plays, entertainment programs, participating in conversations, etc. In such cases the first and most essential technique is to improve the auditory verbal comprehension. Personality traits strongly influence the patient's attitude toward speech re-education. Many cases lack the power to initiate an activity themselves. Most of the activities of the central nervous system are slowed. Any function, including linguistic activity, is likely to lack order, rhythm, and coordination. Attention lags and comprehension becomes blurred when the discussion is complicated. Emotional outbursts and frequent expressions of profanity usually indicate that the situation has become too difficult. Psychotic manifestations are not common. The term 'hysterical aphasia' is a misnomer. The symptoms of aphasia are too subtle and too complicated to be simulated by any one who has not had first hand experience with the affliction. The most intelligent and well-educated patients are often the worst subjects for re-education because they remember too well their former abilities. Most cases require a certain amt. of individual assistance but group activity also helps. Some cases are capable of spending 3-6 hrs. a day on re-education. A decision often has to be made whether to permit a shift of handedness or whether the preferred hand will recover. Language improvement is usually slow and the smallest gain must receive encouragement by all.—*M. F. Palmer.*

5265. Irwin, Orvis C., and Han Piao Chen. (*State U. Iowa, Iowa City.*) Infant speech: Vowel and consonant frequency. *Jour. Speech Disorders* 11(2): 123-125. 1946.—95 infants from birth to 2.5 yrs. were studied, in deriving equations for vowel and consonant frequencies during these yrs. Two equations are needed to express vowel frequency development. The 1st, which includes the first 2 yrs. of life, is  $V_f = .69A + 51.8$ . The 2d equation is  $V_f = 11.78A^{2.5}$ . The equation derived from the means of consonant frequency is  $C_f = 12.5^{.60} 124.4$ . This is an exponential curve. Throughout the first 30 months of life the frequency of vowel sounds exceeds consonant sounds. At the first bimonthly period vowel sounds occur about 5 times more frequently than consonants, and not until the last 2-month period are they approx. the same. The processes of development for vowel and consonant frequency are radically different. It is reasonable to assume that these 3 equations express the laws of phonemic frequency development during infancy.—*M. F. Palmer.*

5266. Irwin, Orvis C., and Han Piao Chen. (*State U. Iowa, Iowa City.*) The type-token ratio applied to infant speech sounds. *Jour. Speech Disorders* 11(2): 126-130. 1946.—The type-token ratios of infants under 1 yr. of age are presented in relation to the size of the token and to the age of the infant. The type-token ratio is the relation between the

number of different categories of phonemes to the total number of speech sounds in a given sample. The data analyzed were based upon speech sound samples obtained from infants 12 months old and under. They were further sub-divided into 6 age levels with a 2-month period as a level. The number of infants for each age level from the younger to the older group were 62, 80, 75, 64, and 62, respectively. All the infants appeared to be normal. Type-token ratios of infants under 1 yr. of age were taken and a 3-dimensional graph presented showing the interrelationships of the 3 variables, type-token ratio, age and size of token. A description of the construction of the graph and directions for its use are outlined. In order to test the validity these readings were compared with corresponding values calculated from analysis. Differences between analysis and graph are negligible.—*M. F. Palmer.*

5267. Knowler, Franklin H. (State U. Iowa, Iowa City), and Marjorie Emerson. (McKinley High Sch., Cedar Rapids, Iowa.) Indices of achievement in voice instruction. *Jour. Speech Disorders* 11(2): 159-163. 1946.—Four groups of students were studied: 17 students in Group I, 15 in Group III, the controls being 11 students in Group II, and 13 in Group IV. All subjects were students of McKinley High School, Cedar Rapids. Groups I and II were given a test of ability to use tonal symbols communicating emotional moods and meanings, and read a short passage 1.5 to 2 minutes in length. Skilled college speakers on these tests received scores of 80-95% intelligibility. Groups III and IV were tested completely by recording of material. Conclusions were as follows:—The intelligibility test of tonal symbolism provides a practical test of achievement in the use of voice in speech instruction. Recordings of a short sample of oral reading are useful in providing an index of achievement in voice usage. Ratings of single trained but independent judges, although highly variable, are on the average higher than ratings of more generalized achievement in speech. The rating-rerating reliability of single judges was about the same as inter-rater reliability. The use of paired comparisons will reveal improvement not recognized when a single standard of judging records of achievement is employed. Voice improvement of far greater significance may be expected from a unit of concentrated instruction than can be expected from incidental voice instruction in a general speech unit. The cases were not told that they were to be retested. Group I received instruction in motional meanings and special individual instruction in the whole material. Group II, the control, was given simple work in informal speech activities. All of Groups I, II, III, and IV were retested 6 weeks later.—*M. F. Palmer.*

5268. Moore, Wilbur E. (Central Michigan Coll. Educ., Mount Pleasant.) Hypnosis in a system of therapy for stutterers. *Jour. Speech Disorders* 11(2): 117-122. 1946.—40 stutterers under treatment at the Speech Clinic of Cent. Mich. Coll. of Ed. were subjected to hypnosis. 31 were sufficiently responsive that some type or degree of somnambulism could be induced. 35 of the 40 subjects reported good relaxation. In 5 of the subjects certain data, which in the writer's opinion, could not have been recalled without the aid of hypnosis, proved to be of great use in explaining to the stutterers a possible basis of their signal reactions to speech and to human beings. Three cases of successful treatment of stuttering are reported, one with two years essential freedom from stuttering. Hypnosis consisted of direct therapeutic work in which it was suggested to the individual that he could talk in an easy, relaxed manner undisturbed by pauses. All cases received other clinical help.—*M. F. Palmer.*

5269. Rutherford, Berneice (Folwell Junior High Sch., Minneapolis, Minn.), Lillian Read (Minneapolis Publ. Sch., Minn.), and Myfanwy Chapman. (U. Minnesota, Minneapolis.) Metropolitan speech correction. *Jour. Speech Disorders* 11(2): 131-134. 1946.—43 metropolitan school systems of over 100,000 population on a questionnaire indicated that the lower the ratio of the school population to the number of speech clinicians, the more adequate the speech correction service. The itinerant teacher plan and semi-weekly service in elementary schools were typical and did not seem to be related to adequacy of service. As a general rule, there was inadequacy of service. A combined clinical survey and classroom teacher referral, or a combination of referral

from many sources, were typical patterns. Speech correction service was given to about 2% of the elementary population. Speech clinicians in most cities were required to have either specialized training or a degree in speech pathology. The questionnaire method of study allows for variation of interpretation.—*M. F. Palmer.*

5270. Sheehan, Vivian Mowat. (Percy Jones Hosp., Battle Creek, Mich.) Rehabilitation of aphasics in an army hospital. *Jour. Speech Disorders* 11(2): 149-157. 1946.—Description of the program of the rehabilitation of aphasics at the Percy Jones General Hospital in Battle Creek. Communication is damaged in these cases and many simple problems are involved which become gradually of great worry to the aphasic. He soon becomes aware he can no longer do many simple things he once took for granted. Usually these faults in reading and writing are blamed on paralysis or other functions. More serious difficulties arising from the usually reduced capacity for abstract thinking, from memory defects, from a shortened attention span, lack of ability, need for rest and sleep, anxieties, etc., almost complete lack of sense of humor, make the whole problem extremely difficult. Group work is stressed as valuable since, although this is less efficient, the cases inspire each other. Most aphasics are quite confused on left and right. Speech vocabulary has to be built in organized manner. Imitation is vitally important but all possible approaches must be used. Metal letters are valuable arranged on a black table in teaching reading and spelling. The "Sound Mirror" is a useful bit of equipment. Basic English is helpful in aiding the individual to get an adequate expression without having to learn too large an amount of vocabulary. Writing, arithmetic, group singing, typing, mathematics, and any other subject may be used to help the patient along. Speech and language training are co-ordinated with work in occupational therapy and physiotherapy. The patient is constantly educated on what aphasia is and what the prospects are for him. A bulletin describing aphasia, published by the University of Michigan Speech Clinic, is sent to all parents and relatives of the patient. Some of the results are measurable; others simply show in the healthier and happier attitudes of those who live in the clinic.—*M. F. Palmer.*

5271. Simon, Clarence T. (Northwestern U., Chicago.) Comments on testing aphasics in the speech clinic. *Jour. Speech Disorders* 11(2): 139-141. 1946.—Information concerning the locus of the lesion is of no value to the speech correctionist. There is no basis in clinical data for the conventional classification of types of aphasia. Any attempt to put patients into these categories or to guide testing and remedial programs on the basis of them militates against substantial results. The specific reason for testing is to discover the specific abilities and disabilities in the patient's existing language process. The best therapy uses the patient's abilities as a basis for training in those skills he needs most for his immediate social and economic demands.—*M. F. Palmer.*

5272. Utley, Jean. (55 E. Washington, Chicago 2.) A test of lip reading ability. *Jour. Speech Disorders* 11(2): 109-116. 1946.—A list of 100 words was compiled from Thorndike's list of most frequently used words by extracting every tenth word from the first 1000. To this was added a sentence test made up of 10 trial statements, 50 common expressions and 20 idiomatic sentences. The tests were first administered to a group of 200 subjects of normal hearing arranged so that the subjects had to lip read the material. Even the youngest child could score on the test. After arranging it in apparent order of difficulty the revised test was administered to 110 students in two schools for the deaf, all known to have at least third grade reading ability. The handicapped group showed a higher degree of proficiency in lip reading than even the best group of normals. Six paragraphs were then selected from the Gates Reading tests and added to the former test. This material did not contribute statistically to the test. The tests were then shortened by removing the most complicated and simplest material. The material was then photographed on black-and-white 16-mm. film for Sentence and Word Tests and Story Tests were added in technicolor. Each test situation was followed by a fifteen second period of black film to allow the individual to write what he thought he saw said. The test, as described, was then administered to 761 cases 8-21 yrs. from the 1st to the 12th grade with the age of onset of deafness ranging from birth

through 15 yrs. For 702 cases, data reporting the cause were available: 'Acquired' deafness 303 cases, 'congenital' deafness 256, 'unknown' deafness 135, and otosclerosis in 8 cases. General lip reading ability was reported by teachers of these hard of hearing children. The conclusions were as follows:—The skills of word, sentence and story recognition are inter-related. There is a great deal of overlapping among the various skills, yet, the combined skills do not represent a single unitary ability; word, sentence and story recognition should be measured separately for diagnostic purposes. Ability to lip read sentences can be predicted more reliably from ability to lip read stories than from ability to lip read words; ability to lip read words can be more reliably predicted from ability to lip read sentences than from ability to lip read stories; and ability to lip read stories can be more reliably predicted from ability to lip read sentences than from ability to lip read words. The internal reliability of each part of the test was shown to be high enough for practical purposes. The coeff. for the Sentence Test was 0.928, the coeff. for the Word Test 0.797, and for the entire test 0.943. Reliable prediction of lip reading ability cannot be made from teachers' judgment ratings. Lip reading ability cannot be predicted from reading level or school achievement, nor from chronological age, age of onset of deafness, or grade placement. The best criterion to be used as the basis for the standardization of a test of lip reading ability is the distribution of scores in percentile ranks. It was not possible to arrange the test items in any order of difficulty. The successes and errors made by the final group tested are distributed evenly throughout the whole test. The highest scores are obtained from a higher over-all response, poorer scores are mainly due to failure with one or another specific group of items.—*M. F. Palmer.*

## ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

5273. Jellinek, E. M. Phases in the drinking history of alcoholics. *Mem. Sec. Stud. Alcohol Yale Univ.* 5. 1-88. 1946.

## MISCELLANEOUS

5274. Mottram, V. H. The physical basis of personality. 126p. 7 fig. Penguin books: New York, 1944.—This book discusses first the mechanism of physical heredity, with chapters reviewing the generally known facts concerning the cell, the "chromosome ballet", the determination of sex, Mendelian inheritance, and mapping the chromosomes. This is followed by a general description of the nervous system, and a chapter on the endocrine organs, in which brief accounts of interesting case histories are given to illustrate various personality changes produced by endocrine disorders. Particular attention is given to the gonads, and the ability of the hormones to condition psychological reactions. The distinctive feature of the book lies in its last chapter, 1/4 of its total length. After summarizing the data which indicate that personality is largely detd. by physical make-up, the author asks whether it is wholly so determined. The conclusions of science are respected because there is a fundamental agreement between qualified observers, whereas judgment in such fields as art or music is peculiar to each individual. Quotations are presented to illustrate the thesis that the mystical experience is also something concerning which there is general agreement, and that it is more common than usually supposed. The outer personality is undoubtedly conditioned by genes and by upbringing, but it is only a "persona" or mask worn by the real inner self, which "partakes of the nature of ultimate reality," and in a truly integrated individual the outer personality is also conditioned by the workings of this inner self.

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Coral reef animals, 5304; Castration as affecting behavior, bitches, 5617; Discrimination of auditory intensities, 5662A; Discrimination of auditory intensities, cat, 5663A; Effect of humidity on oviposition by *Macrocentrus*, 7348; Adaptive behavior, Paguridae 7595; Association of Fowler's toad, 7826; Tail-waving in lizards, 7842; Bird migration and weather, 7869; Territories in birds (Sylvia), 7883)

5275. Gray, J. (Cambridge U., Eng.) Migration of vertebrate animals. *Endeavour [London]* 5(19): 83-89. 4 fig. 1946.—Migrations of cod, European eel larvae and salmon species are cited as representative of fishes. Amphibia and amphibious reptiles migrate, but less spectacularly. Bird migration is more closely related to a seasonal cycle. Water temp. and salinity may direct the migratory movements of fishes. Knowledge of bird migration is very incomplete. Sensory perception and non-directional exploration theories are reviewed. Seasonal, reproductive and uni-directional movement seem characteristic modes of mammalian migration.—*C. E. Packard.*

5276. Milne, Lorus J. (U. Pennsylvania, Philadelphia), and Margery J. Milne. (Beaver Coll., Jenkintown, Pa.) Notes on the behavior of the Ghost Crab. *Amer. Nat.* 80 (792): 362-380. 5 fig. 1946.—From Long Island, N.Y., to Rio de Janeiro, the Ghost Crab, *Ocypode quadrata*, is found on sandy beaches. Behavior of specimens from Townsend's Inlet, N.J., was studied by day and night through the summer and autumn, and specimens were observed for extended periods in captivity. Adults make burrows in the dry beach beyond storm-wave lines and in the dunes, emerging principally at night when they obtain food from the beach drift and wet their modified gill chambers. Females well loaded with eggs were observed in late July. At this time and until Oct., a great variation in size was noted among specimens on the beach, probably indicating that the aquatic megalops stage transforms to the terrestrial crab throughout the summer. In Oct., burrows were higher on the beach and much longer, but specimens were active during a warm spell; apparently the species hibernates in these burrows (which do not reach the water or even wet sand). Heat tolerance is high, but in July exposure for 2 hrs. to 12°C was fatal. Methods of combat and concealment were studied, and differences noted in behavior of the sexes. Males resist being driven into the water, but ♀♀ readily waded out beyond reach. While completely submerged in quiet clear water, gravid ♀♀ force

a current through their eggs by opening the abdominal fold slightly and quickly rotating the body on the bases of the ambulatory legs until the dorsal surface of the carapace is downward. A similar attitude is struck by both sexes in attempting to seize in the chelipeds an enemy which is above them. Normal running on the beach involves all 8 ambulatory legs, but rapid running to escape capture involves only 6 legs, the hind pair being held clear of the ground; additional maneuverability seems to be gained in this way. Captive specimens accepted cold sea water from a pipette, as well as animal matter (dead or alive) including dried insects, but no Ghost Crab would accept fireflies.—*Authors.*

5277. Minami, H., and K. M. Dallenbach. (Cornell U., Ithaca, N. Y.) The effect of activity upon learning and retention in the cockroach. *Amer. Jour. Psychol.* 59(1): 1-58. 1946.—The effect of activity upon retention and relearning of avoidance responses to darkness was studied in the American cockroach, *Periplaneta americana*. Three degrees of activity were used: (a) forced activity on a treadmill, (b) normal resting activity, and (c) inactivity. Learning and relearning were measured in terms of the number of trials required and shocks received in order to reach the criterion (9 avoidance responses in 10 trials). Intervals between learning and relearning from 10 min. to 24 hrs. were studied. It was found that forced activity affects relearning and retention adversely, and that the decrement was due chiefly to the physiological after-effects of activity. Relearning scores were considered to be determined by factor X (anti-consolidation) and factor Y (irritability). Factor X appears when activity follows learning closely, interfering with consolidation of the memory trace. Factor Y has its detrimental effect at the time of relearning. The sleep-like inactive state had a markedly beneficial effect on retention and relearning. The experimenters conclude that the superiority of retention and relearning after inactivity is chiefly due to a lack of irritability and the presence of no anti-consolidation factor.—*J. L. Deese.*



5278. Thomas, F. Über Schutzanpassung, Katalepsie und Tagesrhythmik der Spannerraupe. [Protective adaptation, catalepsy and daily rhythms of spanner caterpillars.] *Biol. Gen. Vienna* 15(1/2): 75-108. 29 fig. 1941.—An analysis of the partial plant mimicry of geometrid larvae, the chief components of which are described as "stretching attitude" and "catalepsy." These 2 occurrences are often associated in the larger spp. of geometers. In the smaller spp. "catalepsy" is usually not in evidence during stretching. On the whole, "waxy flexibility" as a criterion of catalepsy is inapplicable to the geometrid caterpillars, for which a "decrease of irritability" more accurately describes the principal symptom. In *Boarmia consortaria*, *Ennomos alniaria*, *E.*

*autumnaria*, and *E. arrosaria*, a pronounced daily rhythm was observed, the caterpillars remaining in the stretching attitude between feeding periods, which occur after sunset and before sunrise. The adaptive significance of this period of akinesis is suggested by the fact that it occurs during the hrs. in which visually oriented predators upon these caterpillars are abroad. In addition to the stretching attitude, certain spp. also exhibit a "curvature attitude" which is intermediate between the stretching attitude and the "sphinx attitude," as in *Sphinx ligustri*, or the "warning attitude" of *Stauropus fagi*. All of these phenomena appear in their highest development in large spp. of geometers which most closely resemble twigs when in the akinetic condition.—Max Onno.

# ECOLOGY

## Editors

ORLANDO PARK, *General Animal Ecology*  
G. D. FULLER, *General Plant Ecology*  
G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*  
GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL and ANIMAL ECOLOGY]—Insect food of lizard, 7343; of bluebird, 7344; Birds feeding on ants, Utah, 7345; Lizards feeding on ants, Utah, 7346; Anophelines, 7486; Mite, 7617; Mimicry in Nabis, 7706; Desiccation of digestive tract in hibernating Hemiptera, 7707; Association of Fowler's toad, 7826; Color change in chameleons, 7844. [PLANT ECOLOGY]—Browse plants of arid regions of Brazil, 6149; Microbial antibiosis, 6273; Cu-deficiency on peat lands, 6466; Algae of bare rocks, Switzerland, 6538; Bat-pollinated flower, 6803; Response of *Agropyron spicatum* to clipping, 6952; Weather and range-seeding programs, Utah, 6953; Pasture weeds, Fiji, 6975; Definition of mull soil, 7007; Forest communities in New S. Wales, 7141; Balsa, 7151; Forest communities, France, 7163; Trophic activity of endotrophic mycorrhizas, 7181; Antibiotic effects on soil fungi, 7214)

## GENERAL

5279. Castro, G. M. de Oliveira. Filogênese e sucessão. [Phylogeny and succession.] *An. Acad. Brasil. Cienc.* 18 (2): 121-125. 1946.—Among the Culicinae there is a succession of faunas, with the less specialized species in each group breeding in exposed water pools under pioneer conditions and the more specialized in the forest, in stabilized habitats. The pioneers include more of the widely distributed genera, and those in more advanced habitats include more of the endemic genera. Plant communities at Teresopolis show the same relations between distribution and habitats. In Canada, following Dansereau, more of the pioneer plant genera are widespread, and more of the climax types are holarctic in distribution.—J. L. Cartledge.

5280. Kühnelt, W. Über die Beziehungen zwischen Tier- und Pflanzengesellschaften. [Relations between animal and plant communities.] *Biol. Gen. [Vienna]* 17(3/4): 566-593. 1943.—Whereas animal and plant spp. are seldom very closely connected to one another (except monophagous spp.) and the attachment of animal spp. to plant communities is not often very stable, plant and animal communities are often largely dependent upon each other. The author's studies in various Carinthian forest-types (Austrian Alps), supported by the botanical data furnished by E. Aichinger (Villach), showed that every forest community has several animal spp. (chiefly invertebrate), perfectly or nearly limited to it so that, though many of these spp. can live as well at other places, yet the species combination as such is the animal component of the forest community. Animal as well as plant communities can thus be defined by a "characteristic species combination". Some animal communities have a great ecologic valency, inasmuch as they can live in various forest types. But also within one type of plant community, group differences can be found in animal life as well as in plant undergrowth, e.g., between beech forests of the upper and lower altitude zones. Each of them has its characteristic animal spp., and the lower story of beech forests also has certain spp. in common with Illyric hardwood forests and *Querceto-Carpinetum*, the upper story with *Piceetum*, thus confirming genetic relations. Artificial spruce forests, planted in place of ancient beech forest, showed the *Fagetum* animal community throughout, though somewhat reduced in number. As the cause of this dependency the author considers the "factor gradients" of light, temp., air, humidity, etc., present in various plant associations. The composition of organic world ("biocenosis") of a given stand proves thus the best expression of its life conditions. Plants and animals are closely interrelated in successional development, as illustrated by the example of the settlement of rock-fissures, initiated by soil animals preparing the ground for plant settlers, which in their turn allow more sensitive animals to colonize.—Max Onno.

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Radiation meter, 5236; Heat death in Diptera, 5300; Weather as affecting Bombay harbor water, 5325; Seasonal effect on B.M.R. of college ♀♀, 5465; Environmental temps. in relation to body temp. in dogs, 5582; Survival of hypothermia by men immersed in ocean, 5584; Temp. and humidity as affecting water and heat loss in subtropical climate, 5677; Climatologic data in relation to epithelioma, 5878;

Effect of low environmental temp. on formation of spontaneous mammary carcinoma in mice, 5974; Precipitation, Utah, 6953; Influence of rainfall on growth of cantaloupes, 7096; Climatological basis of forestry, 7141; Effect of humidity on oviposition by *Macrocentrus*, 7348)

5281. Albert, Leo. Notes on the weather and climate of Seymour Island, Galapagos Archipelago. *Bull. Amer. Meteorol. Soc.* 27(5): 200-209. Map. 1946.—Meteorological and climatological observations made by the U. S. Army Air Corps between Aug., 1942, and Aug., 1945, are summarized and discussed. Remarks on vegetation and rainfall.—Frederick Sargent.

5282. Bacsó, N. [Agronomic-meteorological projects.] *Kiserletügyi Közlemények* 45: 109. 1942.—The tasks of the future of agro-meteorology, with special regard to the aims of the planned regional production of plants, are enumerated.—S. A. Arany.

5283. Baur, F. Über die grundsätzliche Möglichkeit langfristiger Witterungsvorhersagen. [The theoretic probability of a long-range forecasting.] *Ann. Hydrogr.* 72: 15-25. 1944.—The application of probability laws to the study of the variations of several meteorological elements (observed for 50 yrs.) leads to the following conclusion: (1) there must be variables of conditions which cause the variation, from one year to the next, of the probabilities of having a long period of a certain type of weather; (2) the variation of these probabilities has a much greater influence on the character of the weather than does the variation of probabilities of seasonal changes.—*Courtesy Bull. Amer. Meteorol. Soc.*

5284. Berger, P. Cellophane balloons. *Arch. Sci. Phys. et Nat. [Geneva]* 27: 26-55; 59-78. 1945.—This paper concerns the replacement of rubber by cellophane for balloon fabrics, and deals with tensions in the balloon cover, balloon shapes, balloon construction, internal pressure, the properties of cellophane, thermal influence on the extension and resistance to rupture of cellophane, diffusion loss, influence of humidity and of water, influence of light, diffraction of X-rays by cellophane, deterioration of cellulose, balloon equipment, ceiling (maximum altitude attainable), balloon ascension and velocity, analysis of balloon deformations, and by hydroaerodynamic brakes. The balloons discussed are of such a construction that should they be abandoned fortuitously without a load, they do not rise with their major axes vertical, but roll so that the major axes tend to become horizontal whatever the direction. At high altitudes, the balloons are superior to those made of rubber which are too sensitive to ultra-violet radiation.—H. H. Ho (*courtesy Phys. Abst.*).

5285. Farrow, B., and M. O. Pelton. A photographic daylight recorder. *Jour. Sci. Instruments* 22: 210-213. 1945.—The instrument gives a continuous photographic trace of the logarithm of intensity against time which is integrated to an energy figure by photometric means, an optical wedge being used to reduce the logarithm to intensity. A brief comment is made on the results obtained over a period of 9 yrs.—*Courtesy Phys. Abst.*

5286. Foster, N. B., and L. W. Foskett. A spectrophotometer for the determination of the water vapour in a vertical column of the atmosphere. *Jour. Optical Soc. Amer.* 35: 601-610. 1945.—A transmission replica grating is used as the dispersing element and an infra-red-sensitive photo-

tube as the energy receiver. The photo-tube current is amplified by a negative feed-back d. c. amplifier and is read either by means of a 500  $\mu$  A meter or recorded by a high-speed potentiometer recorder. Measurements are obtained by comparing the radiant flux in the 0.94  $\mu$  water-vapor absorption band with that at 1.01  $\mu$  where no absorption occurs. A single-mirror heliostat is utilized to keep the spectrophotometer focused on the sun. An approximate calibration was obtained by plotting the spectrophotometer ratios against the total precipitable water values in a vertical column of the atmosphere as calculated from radiosonde moisture data. The apparatus is cheap to construct and simple in operation.—*Courtesy Phys. Abst.*

5287. Frolow, S. Sur la prévision des époques pluvieuses. [Forecasting rainy seasons.] *Compt. Rend. Acad. Sci. [Paris]* 219: 459-461. 1944.—The distribution of rainy days can be analyzed by harmonic analysis, for general influences (annual course, etc.) and probably for forecasting.—*Courtesy Bull. Amer. Meteorol. Soc.*

5288. Koch, Lauge. The East Greenland ice. *Meddelelser om Grønland* 130(3): 1-373. 76 maps, 15 fig. 1945.—This extensive work deals with the ice in different regions at different periods, and is divided into 5 sections: I. Ice terminology; II. Recent ice observations in East Greenland; III. The East Greenland ice in the present century; IV. Statistical treatment of the ice around Iceland and southern Greenland; and V. Ice conditions in the past centuries. It is concluded that in the period 800-1200 there was hardly any ice in the summer near Iceland and the southern half of Greenland; in the period 1200-1400 there was somewhat more; in the period 1400-1600 the ice decreased in quantity; in the period 1600-1900 there were exceptionally large quantities of ice in the summer near Iceland and the southern half of Greenland; and in the period 1920-1939 there was hardly any ice. The 1st cold period, c. 1200-1400, presented no serious obstacles either to the Norsemen or to the Eskimos, but the 2d cold period, c. 1600-1900, was a catastrophe to the Eskimos. The present population must be regarded as relics of the representatives of a large uniform Eskimo culture which was distributed all over West and East Greenland about the year 1500.

5289. Liepmann, K., and H. W. Liepmann. A dewpoint meter using cooling by expansion of CO<sub>2</sub>. *Rev. Sci. Instruments* 16: 36-37. 1945.

5290. Pollak, L. W. Further remarks on early uses of punched cards in meteorology and climatology. *Bull. Amer. Meteorol. Soc.* 27(5): 195-199. 1946.—The remarks of M. C. George [see *B.A.* 19(8): entry 15425] are amplified and several additional references are given.—*Frederick Sargent.*

5291. Romell, Lars-Gunnar. (Swedish Forest Res. Inst., Stockholm.) Organic dust in the air, and the ammonia found in atmospheric waters. *Svensk Bot. Tidskr.* 40(1): 1-8. 1946.—Nessler's reagent, used for determining NH<sub>3</sub> in atmospheric waters, is likely to have given values in excess of the true ones because of organic dust contaminating the waters collected for analysis. Great errors may have been caused by pollen alone. This is indicated by analytical tests and estimates of the amts. of pollen produced by trees. It should be noted that the data include no counts from heavily wooded country and that the yields computed are referred to area covered by crowns, not to area covered by forest. Season-bound errors such as can be expected from pollen may, even when moderate in amt., have influenced the interpretation, ecological and otherwise, of the data assembled in various countries.—*H. Horn af Rantzen.*

5292. Sarle, Chas. F. (U. S. Weather Bur., Washington, D. C.) Applications of climatology to building construction and agriculture. *Bull. Amer. Meteorol. Soc.* 27(5): 210-215. 1946.—The author stresses the need for a more widespread use of climatological data in building construction and agriculture. Plans proposed by the Weather Bureau for providing essential climatological service for building construction and agriculture are presented. The fundamental problem, in either case, is to make the necessary climatological data readily available on punch-cards so that the many and varied special problems may be efficiently investigated.—*Frederick Sargent.*

5293. Sheppard, P. A. Anemometry: A critical and historical survey. *Proc. Phys. Soc. [London]* 53: 361-390.

1941.—Historical; classification of anemometers and descriptions. Measurement of the direction of the wind. Bibliography.—*Courtesy Bull. Amer. Meteorol. Soc.*

5294. Visher, Stephen S. (Indiana U., Bloomington.) When the seasons begin in Indiana. *Proc. Indiana Acad. Sci.* 55: 144-146. 1946.—If the year is divided into quarters on the basis of normal temps., winter commences in Indiana on Dec. 3, spring on Mar. 4, summer on June 7, autumn on Sept. 8. Temps. commonly considered appropriate for the various seasons come, however, at different dates in different parts of the State. Appreciable plant growth starts with daily normals of 35°, which come about March 1 in southern Indiana, Mar. 15 in north-central. The commencement of rapid growth of maize (normals of 55°) comes about Apr. 20 at the southwest, about Apr. 25 in central Indiana, and in early May at the north. These dates are approx. those of the usual last killing frost. Summer temps., 68° normals, reach southern Indiana in late May, central Indiana in early June, northern Indiana in mid-June. Hot summer, normals above 75°, commences about July 1 in southern Indiana, in mid-July in north-central Indiana. Winter temps., normals of 32°, arrive about Dec. 1 at the north, but about Dec. 22 in most of southern Indiana. Indiana has no distinct seasons of precipitation. However, the first considerable snow usually falls in central Indiana in the first week of Nov.—*S. S. Visher.*

5295. Visher, Stephen S. (Indiana U., Bloomington.) Relative cooling requirements for American homes. *Sci. Month.* 63(3): 209-212. 6 fig. 1946.—A series of maps based on official data show areas in the U. S., particularly on the Gulf coast and in the arid southwest, where there is need for artificial cooling if maximum comfort and intellectual activity are to be maintained. This will be particularly difficult in an area of high humidity where mild winters have permitted the construction of poorly insulated houses.—*H. F. Copeland.*

5296. Werner, P. Wilh. Notes on flow-time effects in the Great Artesian Aquifers of the Earth. *Trans. Amer. Geophys. Union* 27(5): 687-708. 1946.—The dried out oases in Egypt, the present-day sterility of old cultivated lands in Turkestan in Asia, and the possibility of dwindling yield of the artesian waters in the Great Australian Basin are discussed from a physical-mathematical theory.—*V. Conrad.*

## ANIMAL

5297. Baker, W. L. (U. S. Bur. Ent. and Pl. Quar., Beltsville, Md.) DDT and earthworm populations. *Jour. Econ. Ent.* 39(3): 404-405. 1 fig. 1946.—In Sept., 1944, part of an American elm stand near Columbus, Ohio, was sprayed with an emulsion containing 0.25% DDT with xylene and Triton X-100. Within a month leaf fall was complete and drought, prevailing at the time, continued until spring. In mid-March, 1946, the stand was visited and observations were made on the extent of earthworm feeding on the fallen leaves in both the sprayed and unsprayed areas. Little evidence of earthworm activity was apparent in either area at this time. A month later, however, the ground surface in the unsprayed part was practically devoid of leaves and the ground was peppered with middens; whereas, in the sprayed part, leaves still covered the ground and only an occasional midden could be seen. By mid-May these differences were no longer apparent as the remaining worms in the sprayed area had succeeded in dragging all of the leaves into their burrows and their middens appeared to be as abundant as in the unsprayed area.—*W. L. Baker.*

5298. Goetsch, W., und R. Grüger. Pilzzucht und Pilznahrung staatenbildenden Insekten. [Fungiculture and fungal nutrition of social insects.] *Biol. Gen. [Vienna]* 16 (1/3): 41-112. 22 fig. 1942.—Fungal nutrition is far more frequent with social insects than hitherto supposed; also, certain groups of termites considered as purely lignivorous, such as ssp. of *Kaloterms* and *Reticuliterms*, use various fungi as additional food, and can live on these a long time. Since in these termites fungal nutrition is not yet constantly fixed, it is concluded that they represent initial stages of an evolutionary series leading towards spp. feeding exclusively on fungi. Of the purely fungivorous final stages, which have lost their cellulose-digesting symbionts, we have little information, not knowing even the kinds of fungi in the termite hotbeds. In ants, on the contrary, we know best the fungi



of the highly specialized Attinae, and know that there was a coincidence of a number of factors necessary for establishing the highest form of symbiosis. We can only conjecture as to how this extreme was gradually attained. The point of departure was probably in grain-gathering ants such as *Solenopsis*, *Pheidole*, and *Tetramorium*. Infestation of their provisions by fungi may have led to a new food source. Evidence for this hypothesis apparently was found in a new nest of *Acromyrmex*. There is neither a "choice" of particularly fitted plant fragments nor a pure culture from which useless elements would be eliminated, but a coincidence of ants and fungi, both with special biological properties. Both fungi-growing ants and termites increased in number in human settlements because of the abundance of material furnished by cultures and buildings. Biological control measures devised by the author are given.—*Max Onno*.

5299. Hewatt, Willis G. (*Texas Christian U., Fort Worth.*) Marine ecological studies on Santa Cruz Island, California. *Ecol. Monogr.* 16(3): 185-210. 1946.—The marine invertebrates of Santa Cruz Island were collected at 6 shore stations in the summer of 1939. Shallow water dredgings were also made at 10 stations in the island waters. The faunas of the stations are described and listed. Distribution records of the organisms of this transition region are presented. The records of 41 spp. of fishes collected by Dr. Carl Hubbs are also included. The ranges of 49 of the spp. are extended by these studies.—*W. G. Hewatt*.

5300. Larson, Ellinor Bro. Problems of heat death and heat injury. Experiments on some species of Diptera. *K. Danske Videnskab. Selskab. Biol. Meddelel.* 19(3): 1-52. 1 pl., 3 fig. 1943.—Studies were made of the heat death of *Musca domestica*, *Lyperosia irritans*, *Stomoxys calcitrans*, *Haematobia stimulans* and *Scatophaga stercoraria*. Eggs are most sensitive to high temps., pupae least sensitive, larvae are intermediate. Symptoms of heat death and heat injury are described. Often death occurs long after exposure to heat. The author speculates as to the reason for this. The heat death of the various spp. is compared and correlations are made with the ecological behavior. Temp. coeffs. are calculated on the basis of Bělehrádek's empirical formula.—*L. V. Heilbrunn*.

5301. Oswald, Mary Louise. (*U. Colorado, Boulder.*) Faunal zones of the Pierre formation in the foothills of northern Colorado. *Univ. Colorado Stud. Ser. A* 27(3): 57-58. 1945.—It is impractical to divide the Pierre formation into zones by faunal assemblages alone. By combining lithologic and faunal studies, 5 zones are recognized; from oldest to youngest these are Sharon Springs, Rusty, Baculite, Hygiene, and Transition.—*G. Alexander*.

5302. Packard, Fred Mallery. (*U. Colorado, Boulder.*) An ecological study of the bighorn sheep in Rocky Mountain National Park, Colorado. *Jour. Mammal.* 27(1): 3-28. 2 fig. 1946.—The ecology of the Rocky Mountain Bighorn (*Ovis c. canadensis*) in Rocky Mountain Natl. Park was studied by field observations, laboratory analysis of soil, water and fecal specimens, and collection of information from other observers. The advent of white settlers caused an initial decline, due to hunting for market and sport, restriction of the lower winter range and the introduction of scabies. Adequate protection after 1909 resulted in a recrudescence, a second decline becoming evident in 1921 and continuing to the present. This has been traced tentatively to an apparent deficiency of mineral salts in the granitic soils of the present ranges. The mineral deficiency may be accompanied by protein deficiencies as well. The effect appears to be a reduction in the stamina of the sheep, with an increased susceptibility to internal parasites, especially *Protostrongylus* and coccidia. Further debility, and possible irritation of the bronchial membranes by lungworms, admit pneumonic bacilli, *Pasteurella ovisseptica* and *Corynebacterium pyrogenes*, that effect the death of the sheep from hemorrhagic septicemia. Placing of mineralized salt blocks on the range is recommended. Competition by elk and predation are considered of negligible effect. Approx. 300 bighorns inhabit the park.—*F. M. Packard*.

5303. Schmidt, Karl Patterson. On the zoogeography of the Holarctic Region. *Copeia* 1946(3): 144-152. Map. 1946.—A restatement of the faunal relations of western Eurasia and western N. America, contrasting them with the more ancient but otherwise similar relations of eastern Asia

and eastern N. America, and interpreting the former relation as in part produced by the emigrations from the unglaciated faunal reservoir of northern Asia.—*K. P. Schmidt*.

5304. Stephenson, T. A. (*Univ. Coll., Aberystwyth, Wales.*) Coral reefs. *Endeavour [London]* 5(19): 96-106. 6 col. pl. 1946.—The coral fauna of the Great Barrier Reef of Australia is illustrated and described, largely from the standpoint of artistry and coloration. Commensals (crabs, prawns, fish) of brilliantly harmonizing and contrasting hue find shelter with the corals, affording opportunity for certain kinds of studies in animal behavior.—*C. E. Packard*.

## PLANT

5305. Aichinger, E. Über Relikte aus der postglazialen Würmezeit und der Zeit der Klimaverschlechterung in Kärnten. [Relics from the postglacial warm period and from the time of climate deterioration in Carinthia.] *Biol. Gen. [Vienna]* 17(1/2): 80-93. 1943.—The author deduces that both *Wulfenia carinthiaca* and *Rhododendron luteum* were introduced into Carinthia by man and conserved at their present stations by human cultural influences, viz., *Wulfenia* by pasturing, *Rhododendron* by raw-humus formation subsequent to leaf-litter use.—*Max Onno*.

5306. Baxter, Dow V. (*U. Michigan, Ann Arbor.*) Occurrence of fungi in the major forest types of Alaska. *Papers Michigan Acad. Sci., Arts and Lett.* 31: 93-115. 1945 [1947].—The study of fungus populations in the various stages of development of a forest is relatively new, although it has been known for a long time that they play a definite role in the life cycles of plant communities. Often fungi are directly responsible for the changes in the composition of associations of higher plants. It seems clear, therefore, that ecological-pathological studies of the "normal" fungus cycle in major forest types will aid in planning effective measures for minimizing losses caused by pathogenic fungi. The occurrence and rôle of fungi in plant succession in the major forest types of Alaska are presented. This series includes: (1) forest and fungus succession of interior river valleys with meandering streams, (2) forest and fungus succession after the retreat of a mountain glacier, (3) forest and fungus succession where flora includes species characteristic of both coastal and interior forests, (4) forest and fungus succession on Kodiak Island, (5) forest and fungus succession after the retreat of a glacier in the Pacific Coast region.—*D. V. Baxter*.

5307. Braun-Blanquet, J. Sur l'importance pratique d'une carte détaillée des associations végétales de la France. [The practical importance of a detailed map of plant associations of France.] *Sigma Commun. [Montpellier]* 86. 6-18. 3 fig. 1944.—The author stresses the need of detailed phytosociological mapping since plant communities often reveal differences of geological subsoil, water content, etc., the knowledge of which can be valuable to agriculture and afforestation.—*Max Onno*.

5308. Braun-Blanquet, J., und R. Tüxen. Uebersicht der höheren Vegetationseinheiten Mitteleuropas (unter Ausschluss der Hochgebirge). [Synopsis of the higher vegetation units of central Europe, excluding the high mountains.] *Sigma Commun. [Montpellier]* 84. 1-11. 1943.—An enumeration and characterization of the central European classes, orders, and alliances (Verbände) of plant communities. 20 classes are distinguished, each of which is divided into several orders and alliances.—*Max Onno*.

5309. Campbell, D. A. (*Soil Conserv. and Rivers Control Comm., Wellington, New Zealand.*) Soil conservation studies applied to farming in Hawke's Bay. III. Investigations into revegetation of eroded areas. *New Zealand Jour. Sci. and Tech.* 27A(5): 426-444. 1946.—Revegetation trials were established in several typical locations on sheet- and slip-eroded areas and the effect of cultivation, fertilizer crops, and other protection studied. Observations were made on natural colonization of eroded areas and on other plants that may be useful in erosion control. It was found that the revegetation of severely eroded areas was possible. Slight modifications in treatment were necessary according to the type of erosion and soil. There was little difficulty in establishing desirable grasses and clovers such as cocksfoot (*Dactylis glomerata*), crested dogtail (*Cynosurus cristatus*), *Poa pratensis*, and white clover (*Trifolium repens*), if the area was fenced from stock, top-dressed, cultivated, and protected in the initial stages by a quick-growing cover crop of blue

lupin (*Lupinus* sp.), or cereal. Several native plants proved to be useful volunteers on eroded areas—*Danthonia pilosa* and *D. semiannularis*, manuka (*Leptospermum scoparium*), and koromiko (*Hebe salicifolia* and spp.)—while sorrel (*Rumex acetelosa*), suckling clover, and catsear (*Hypochaeris radix*) are useful exotics. Manuka was a natural nursery for the ultimate regeneration of rewarewa, totara, and even rimu-matai forest. If protected from grazing and fire, the native beech forest regenerates and spreads successfully on the high country. Several trees, including willows, poplars, prickly acacia (*Robinia pseudoacacia*), and the native cabbage-tree (*Cordyline australis*), are well adapted to reduce soil movement and improve the steeper hill country pastures, and so a compromise between grass and trees is indicated as desirable in many areas. The ranker growing, deeper rooting, and more protected grasses such as cocksfoot, paspalum, and *Phalaris tuberosa* and the native *Agropyron scabrum*, together with the spaced planting of deciduous trees and a dominantly cattle-farming economy, appears to be axiomatic if farming of the steeper slopes is to be permanent. On unstable hill country, pampas grass (*Cortaderia selloana*) merits extended use on the better soils.—*Auth. summ.*

5310. Coetzee, J. A., M. I. Page, and D. Meredith. Root studies in highveld grassland communities. *S. African Jour. Sci.* 42: 105-118. 1946.—Descriptions are given of rooting systems of most of the important grasses. Over 70% of roots occur in the top 8 inches of soil, and more than 50% in the top 4 inches.—*G. W. Sinclair.*

5311. DuVigneaud, P. Les associations épiphytiques de la Belgique. [The epiphytic associations of Belgium.] *Bull. Soc. Roy. Bot. Belgique* 74: 32-53. 1941-1942.—The distr. of epiphytic associations is chiefly regulated by climate humidity. In Belgium, there are 3 distinct regions: a) the center of the country (less than 750 mm. rainfall per year) characterized by the *Lecanorion conyzaeae*; b) a maritime region, more humid: *Physciotum adscendentis*, *xanthorhiesotum parietinae* and *Buellietum canescens*; c) the east of the country (more than 750 mm. rainfall): *Parmelietum acetabulae* with *Usneion barbatae* and *Depranion cupressiforme*.—*Ray Bouillenne.*

5312. DuVigneaud, P. Les "Caricetalia fuscae" au plateau de Recogne. [C. f. on the Recogne plateau.] *Bull. Soc. Roy. Bot. Belgique* 75: 29-38. 1943.—From his phytosociological study the author concludes that the associations of low and high moors may be put together in a new Class for which he suggests the term *Sphagneto-Caricetalia fuscae*.—*Ray Bouillenne.*

5313. DuVigneaud, P. Les associations à *Empetrum* en Belgique. [Empetrum associations in Belgium.] *Bull. Soc. Roy. Bot. Belgique* 75: 39-43. 1943.—*Empetrum nigrum* characterizes the high moors produced by the association *Sphagnetum medii et rubelli* Schw. 1940.—*Ray Bouillenne.*

5314. Gentry, Howard Scott. (U. Michigan, Ann Arbor.) Notes on the vegetation of Sierra Surotato in northern Sinaloa. *Bull. Torrey Bot. Club* 73 (5): 451-462. 5 fig. 1946.—A descriptive account of the geography and vegetation of a minor mountain range, reaching elevations of 7000 ft. and not previously known from literature. The climate is subtropical. Agriculture is limited to local but increasing milpas with the usual staples of maize, beans, and squash. Other crops include wheat, potatoes, apples, peaches, and the opium poppy. Coffee is notable as the most northern locality known in North America. The natural vegetation is subtropical and classified zonally as, Thorn Forest, Short-tree Forest, Oak Forest, Tropical Montane Forest, and Pine Oak Forest.—*H. S. Gentry.*

5315. Horvat, A. O. Mediterrán elemek a Baranyai flórán. [Mediterranean elements in the flora of Baranya.] 12p. 4 pl. Pannonia-Könyvtar: Pécs, Hungary, 1936.—The list comprises 252 flowering plants growing in the Baranya Comitate (s. Hungary), and indicated as "Mediterranean elements". Habitat photographs of *Plantago argentea*, *Artemisia lobelia*, *Agrimonia agrimonoides*, and *Arum italicum* are given.—*Max Onno.*

5316. Horvat, A. O. Gehört das Hüblland von Simon-tornya zum Mecsek-Gebirge? [Do the Simon-tornya hills belong to the Mecsek hills? Die pflanzengeographische Gliederung des Mecsek-Gebirges. [Phytogeographical division of the Mecsek hills.] *Borbasia* 1(10): 148-150.

Map. 1939; 2(1/2): 1-8. 1940.—The Mecsek Hills in s. Hungary, Baranya Comitate, alt. 600-700 m., are divided into 6 districts, for which a list of special plant spp. (mostly Pontico-Illyrian) is given. The neighboring Simon-tornya Hills, lacking certain southern spp. and having a floristic character more similar to the Great Hungarian Plain (Alföld), thus pronouncedly Pannonic, are excluded by the author from the Mecsek region.—*Max Onno.*

5317. Lam, H. J. (*Rijksherbarium, Leiden, Holland.*) Notes on the historical phytogeography of Celebes. *Blumea* 5(3): 600-640. 2 maps, 2 fig. 1945.—Contains a concise history of the floristic investigation of Celebes (with list of principal collectors). The author's investigations were based upon 734 carefully selected spp. (31 Pteridophytes, 263 Orchids). These groups were, according to their areas, subdivided into 25 categories, belonging to 3 main phytogeographical classes: A) with Western Center (Asia or Sundaland), B) with Northern Center (Philippines), C) with Eastern Center (Moluccas, Australia, Polynesia), all spp. being enumerated. From this it appeared that: a) alleged ancient invasions cannot be proved; perhaps the fairly numerous anomalous areas (incompatible with geological results) partly belong to this category; b) the supposed earlier infiltrations are, in general, in accordance with Sarasin's results; c) most distinct is the Philippine track, which can be traced as far south as S-W. Celebes; d) another fairly distinct track is that between E. Java and S-W. Celebes, but it does not reach far to the north (land-connection is young); e) the relations with the Moluccas are more confused (E. Celebes is very little known), but there is a very distinct track between the Philippines and the Northern Moluccas to New Guinea via the Taland Islands and probably another between E. Celebes and the Central Moluccas; f) S-E. Celebes is a "cul-de-sac" which was apparently exclusively infiltrated from C. Celebes; g) the main connections between Borneo and Celebes seem to have run through the southern Philippines (as was earlier stated by Merrill) from which one track goes eastward via Taland-Halmahera-New Guinea and another southward through N., C. and E. Celebes to the Central Moluccas and New Guinea; h) a great number of anomalous areas has been enumerated, e.g., crossing the Macassar Straits without touching the Philippines or the Lesser Sunda Islands; each of these must be checked separately.—*H. J. Lam.*

5318. Lüdi, W. Der Waldbrand vom Jahre 1944 im Aletschwald bei Brig (Wallis). [The forest fire of 1944 in Aletsch wood near Brig, Switzerland.] *Ber. geobot. Forschungsinst. Rübel Zürich* 1945: 98-106. 2 fig. 1946.—This deals with the development of vegetation in a burnt *Pinus cembra* forest with *Larix* and *Picea*, at 1400-2200 m. Owing to the favorable soil condition, revegetation occurred quickly by *Calamagrostis villosa* grassland, containing most of the flowering plants previously present. *Nardus stricta*, particularly sensitive to burning, did not reappear. Dwarf shrubs had disappeared, but *Vaccinium myrtillus* is growing vigorously. A long time is expected to elapse before a new Rhodoreto-Vaccinietum will arise and tree-growth follow, beginning with willows, birch, *Sorbus aucuparia*, and along with the latter, larch, which will slowly win dominancy. Finally, *Pinus cembra* will appear and after a sufficiently long time will restore the climax of Rhodoreto-Vaccinietum cembretosum. In the immediate vicinity there is an example of natural forest regeneration after a forest fire that occurred in 1896.—*Max Onno.*

5319. Lüdi, W. Die Hochwasserkatastrophe im west-schweizerischen Seeland vom November-Dezember 1944 nebst einigen geomorphologischen und quartargeologischen Bemerkungen. [High water catastrophe in W. Swiss Lake Country Nov.-Dec. 1944 with some remarks on geomorphology and quaternary geology.] *Ber. Geobot. Forschungsinst. Rübel Zürich* 1945: 107-123. 5 fig. 1946.—Studies of sedimentation at the great flood of 1944 showed that the Broya and other brooks, at high water, contain considerable quantities of mineral detritus, which normally are transported to the Murten Lake. This might explain sediments of sands and marls in the neighborhood of ancient river-beds. For larger flood horizons of gyttia-like constitution, as in the "Grosses Moos", one must suppose a high water lasting for many yrs., which could occur subsequent to a radical change in water régime. Damages on field crops are described and

geomorphological and quaternary-geological observations given. The peats and black loams of the Broja valley are shown by pollen-analysis to have been laid down in a *Pinus* period.—*Max Onno*.

5320. Pfeiffer, H. Über örtliche Feinheiten der Assoziationsverteilung. [Slight local variations in the distribution of associations.] *Biol. Gen. [Vienna]* 17(1/2): 147-163. 1943.—The author discusses problems concerning the limits between adjacent plant associations. The most striking case is a zonation which occurs whenever decisive factors decrease or increase in a definite direction. (Cf. Roll, *Biol. Gen.* 16.) The limits between adjacent assns. are the sharper the more they differ from each other. At the limits of 2 more closely related assns., "mixed, contact and connective assns." (Mischungs-, Berührungs- und Verbindungsassoziationen) may occur. Zonation, by shifting of habitat conditions, often changes to succession. The author stresses the importance of physiognomy for the recognition and description of slight local variations in association distribution.—*Max Onno*.

5321. Poole, A. L. (New Zealand Dept. Sci. and Indust. Res., Wellington.) An 'indigenous induced' *Phormium tenax* Forst. swamp in New Zealand. *Jour. Linn. Soc. [London] Bot.* 53(349): 63-70. 2 pl., 2 fig. 1946.—*P. tenax*, a typical lowland species usually confined to swampy habitats, yields leaf fibers which were used by the Maori prior to the advent of the white man in New Zealand. The areas worked were partially drained. This operation had the effect of extending the indigenous stands to form an induced community, in appearance as natural as the original. This study was made on the Moutoa Estate, some 4500 acres along the north bank of the Manawatu River, and describes the general changes in vegetation consequent upon drainage. As the elevation decreases the land becomes correspondingly more liable to inundation and the water-level becomes relatively higher. The communities in order are *Podocarpus* forest, swamp shrub, *Phormium*, *Typha*, and open water with scattered *Carex* species. In this series *Phormium* occupies a relatively narrow zone. With drainage of the wettest land the area suitable to *Phormium* was extended to land hitherto covered by *Typha* and by open water. *Phormium* was also planted on cleared swamp shrub and to a limited extent on *Podocarpus* forest areas. The range of soil moisture conditions on which *Phormium* was grown was therefore extended to include land suboptimal for it. By extensive management and continual removal of competing weeds, both native and exotic, the dominance of *Phormium* was maintained. As a result of drainage in those areas with peaty soil phases *Phormium* was exterminated and replaced by native *Typha* and the exotics *Glyceria* and *Phalaris*.—*M. A. Murray*.

5322. Quantin, A. Note sur l'association à "*Centranthus angustifolius*" et "*Erysimum dubium*" dans le Jura méridional. [Note on the C. a.-E. d. association in the southern Jura.] *Sigma Commun. [Montpellier]* 69. 11-20. 1939.—The above association occurs on shingle (éboulis) of the southern Jura. It is most closely allied to the *Stipa-Calamagrostis* association. Its characteristic spp. are: *Linaria petraea*, *Erysimum dubium*, and *Centranthus angustifolius*. It presents 2 facies, one of which is characterized by *E. dubium*, the other by *C. angustifolius* and *Scrophularia hoppei*. Air and water content of soil was studied. Though developing slowly, the association is of ephemeral duration and is soon invaded by shrubs such as *Corylus* and *Cornus mas* and by numerous grasses which, by degrees, build up a fragmentary Xerobrometum. This in its turn yields to shrubby vegetation and finally to a *Quercus-Carpinus* climax forest.—*Max Onno*.

5323. Roll, Hartwig. Zonation und Sukzession. Zwei Begriffe der Pflanzensoziologie und ihre Zusammenhänge. [Zonation and succession—two concepts of phytosociology—and their relationship.] *Biol. Gen. [Vienna]* 16(1/3): 12-19. 1942.—The former concept signifies a seriation in space, the latter a seriation in time. Zonation often coincides with succession, and can be a valuable help in the investigation of the latter, especially in plant communities of watersides. There are also cases in which zonation evidently does not reflect succession, but comprises several stable associations, e.g., most cases of zonation between rocky heath and mixed oak forest in Kyffhäuser (Central Germany) according to Meusel.—*Max Onno*.

5324. Schlitter, J. Grundzüge der Flora und Vegetation

im Gebiet der oberen Linthebene. [Elements of flora and vegetation of Upper Linth plain.] *Ber. Geobot. Forschungsinst. Rübel [Zürich]* 1945: 62-79. 4 fig. 1946.—The flora and vegetation of the alluvial plains of the Linth itself (Switzerland) and the surrounding mountain slopes are characterized; the following station units (zones) are distinguished, each with several associations: 1) the plain (water plants), 2) hardwood mixed forest, 3) *Fagus-Abies* belt, 4) *Picea* belt, 5) *Larix-Pinus cembra* belt, 6) dwarf shrub and *Carex curvula* belt.—*Max Onno*.

## OCEANOGRAPHY

(See also Entries 5013, 7190)

5325. Bal, D. V., L. B. Pradhan, and K. G. Gupte. (Royal Inst. Sci., Bombay, India.) A preliminary record of some of the chemical and physical conditions in waters of the Bombay harbour during 1944-45. *Proc. Indian Acad. Sci. Sect. B.* 24(2): 60-73. 4 fig. 1946.—In the rainy season (from June 15th to the end of Sept.) the weather was less settled and there were thunder storms and heavy showers of rain. There was a considerable disturbance in the sea and the water was mixed over great depths during this period. In the remainder of the year the winds were lighter and the mixing of water less pronounced. The sky was overcast with clouds for the most part of the rainy season and there was a bright sunlight from Oct. to the end of May, 1945. The temp. of water varied between 24° and 32.5°C. The max. temp. of air was 103.1°F on 24th Mar., 1945. The salinity was low in the rainy season—23.56‰ on 17th July, 1944 and high in the summer—38.4‰ on 21st May, 1945. The pH range was 7.8-8.35. Phosphate was found in quantities varying between 13.04 mg./m.<sup>3</sup> and 37.8 mg./m.<sup>3</sup>. It was as high as 51.9 mg./m.<sup>3</sup> in one sample. The amt. of dissolved silica was greater than any other chemical constituents recorded here. The lowest value was 315 mg./m.<sup>3</sup> and the highest 1953 mg./m.<sup>3</sup>. The minimum and maximum quantities for nitrite were 4.60 mg./m.<sup>3</sup> and 167.1 mg./m.<sup>3</sup> and for ammonia 9.84 mg./m.<sup>3</sup> and 156.3 mg./m.<sup>3</sup>, respectively.—*Auth. summ.*

5326. Dunbar, M. J. (McGill U., Montreal, Canada.) The state of the west Greenland current up to 1944. *Jour. Fish. Res. Bd. Canada* 6(7): 460-471. 6 fig. 1946.—Temp. records from the mouth of Godthaab fjord, west Greenland, during 1942-1944, show a cooling of the water over these 3 yrs., particularly marked in the first half of the yr. The temp. history of the west Greenland current is traced by means of available records since 1883. It is found that warmer conditions existed during the decade of 1880, followed by a colder period up to about 1920, when the present warm period began. The peak of the present warm period appears to have been reached in the middle 1930's, and it is possible that the cycle is about to return to colder conditions, with a weakening of the Atlantic component of the current.—*E. B. Ward*.

## LIMNOLOGY

(See also Entries 5013, 5329, 6372, 7593)

5327. Dvořák, B., Sl. Hejny, a E. Štědrónsky. Pokus s hubením přeslicky mokřadní (*Equisetum limosum* L.) zastíněním. [An expt. on extirpation of horse-tail (*E. limosum*) by overshadowing.] [With Eng. summ.] *Věstník Česk. Akad. Zem.* 20(5/6): 256-260. 2 fig. 1946.—The extirpation of *E. limosum*, the essential component of reed communities of Czech ponds, was hitherto done by repeated cutting in connection with using of lime. A more rational method of extirpation of the horse-tail by shading is described. By this method, in one period of vegetation, about 1/2 of the *Equisetum* plants was destroyed. The next year's plants were much weaker and smaller. The effect is due partly to the physiological factor (shading), partly to mechanical damage (breaking the stems by the raft). The method is practicable only for small flats and not for more extensive areas.—*Antonín Nemec*.

## WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 5395, 5522, 5534, 5546, 5575, 7308, 7583)

5328. Foerster, R. E. Restocking depleted sockeye salmon areas by transfer of eggs. *Jour. Fish. Res. Bd. Canada* 6(7): 483-490. 1 fig. 1946.—Eggs from Cultus



lake, a slower Fraser River tributary, and from Adams R., in the Shuswap Lake region, were transferred to Eagle R., a formerly important sockeye salmon stream at the head of Shuswap Lake. The resulting fingerlings were marked, prior to liberation into Eagle R., by removal of certain fins for subsequent liberation. Recovery of surviving adults—few in the commercial fishery, few, if any, in the original native spawning areas, none at Eagle R. from the Cultus Lake egg transfers and very few from the Adams River shipments—indicates that restoration of depleted sockeye areas cannot be achieved merely by introducing eggs from any outside well-populated areas.—E. B. Ward.

5329. Huntsman, A. G. (Fish. Res. Bd., Canada.) Heat stroke in Canadian maritime stream fishes. *Jour. Fish. Res. Bd. Canada* 6(7): 476-482. 2 fig. 1946.—On June 13, 1942, after a warm period, *Alosa*, *Catostomus*, *Pomolobus*, *Salmo*, *Salvelinus* and other fishes died in parts of the Petitcodiac, Shubenacadie, French, Waugh, and John rivers. The streams affected were moderately rapid, broad, shallow and long, with spring sources. They were low from slight rainfall and in districts with relatively cloudless skies during the period. These streams showed daily minimal and maximal temps. rising steadily (to 88 $\frac{1}{2}$ °F or 31.4°C) under warm moist air conditions, which evidently reduced radiation at night more than insolation during the day.—E. B. Ward.

5330. Magalhães, Elzemann Filho. Processo de determinação da maturidade do camarão. [Method for determination of maturity of prawns.] *Bol. Min. Agric. [Rio de Janeiro]* 32(9): 11-26. 6 fig. 1943.—A detailed description of the external genitalia of *Penaeus setiferus* and *P. brasiliensis* is given and figured. The internal primary and secondary sex organs of both sexes are described histologically. Specimens of both species examined in Aug., Sept., and Oct. were reproductively active.—D. E. Davis.

5331. Maslov, N. A. Tralovyy promysel v Barentsovom more v 1936-38 g.g. [The trawl fishery in the Barents Sea during 1936-38.] *Trudy Polkarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii (Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk)* 6(1): 3-92. 20 fig. 1939.—Statistics of the Russian Barents Sea trawl fishery are analysed over the yrs. 1936-38, with less comprehensive data for earlier yrs. Tables and figures show the total per yr. and its species composition, also the catch from each of 30-odd subdivisions of the Sea. The catch per hr. of trawling is computed for the sea as a whole and for each of the subdivisions, for each month of the yr. Trawling is most successful in summer, winter catches falling off to about  $\frac{1}{3}$ . The cod is usually the dominant species in the catch, though haddock are about equally important in autumn, and in 1938 were about equal to cod in all months except June and July. Other spp. are now very much less important; the "Norway haddock" (*Sebastes marinus*) is the only other species given individual mention, and it amounted to only 2-3% of the total catch during the recent period, though in the early 1930's it had comprised as much as  $\frac{1}{4}$  of the total. Though it has long been fished by vessels of other nations, large-scale trawling by Russian vessels in the Barents Sea is relatively new, and through the 1930's the number of boats used continually increased, while at the same time the area fished has been greatly expanded. There is no tendency for catch per hr. of trawling to decrease, either on the old or the newer banks; in fact 1936-38 catches were consistently greater than in 1926-30. This is largely attributable to a particularly numerous brood of cod (year-class of 1929) which contributed heavily to the catch in 1935-36, and to a similar dominant group of haddock in 1938 (yr.-class of 1933). The smallness of recent catches of *Sebastes*, as compared with the period 1928-31, is largely a result of changes in fishing areas and times, and does not indicate any decrease in supply. As a result of a warming of many parts of the Sea in recent yrs., haddock and *Sebastes* are now found commonly on certain banks where formerly they were scarce.—W. E. Ricker.

5332. Medcof, J. C. The mud-blister worm, *Polydora*, in Canadian oysters. *Jour. Fish. Res. Bd. Canada* 6(7): 498-505. 1946.—*P. ciliata* causes mud blister, often inconspicuous, on the shells of oyster (*Ostrea virginica*) in deep water, in the intertidal zone and in floating trays in many important producing areas but is of industrial importance only in parts

of the Bras d'Or lakes, N.S., where salinities are low and the bottom soft. *Polydora* has no significant effect on the fatness of oysters and is unlikely to create a major industrial problem unless hydrographic conditions change.—E. B. Ward.

5333. Rass, T. S. O razmnozhenii i zhiznennom tsikle Murmanskoi seldi (*Clupea harengus harengus* L.). [The reproduction and life cycle of the Murman herring.] *Trudy Polkarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii (Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk)* 6(2): 93-164. 14 fig. 1939.—The herring of the Barents Sea are all referred to *C. h. harengus*, aside from two populations of *C. h. pallasi* in its southeastern corner. Typical *harengus* occurs in 3 forms: the Norwegian spring herring, the Murman oceanic herring, and the Murman fjord herring. The first of these has been studied intensively all along the Norwegian coast, where it spawns principally between latitudes 58° and 63°. The work of Norwegian and other biologists shows that the young move northward along-shore and enter the western Barents Sea near the North Cape while still quite small. They do not penetrate far, however, and return slowly southward, making excursions far offshore. The Murman oceanic herring is the dominant form in the Barents Sea. By an analysis of the sizes of larvae caught in numerous plankton hauls along the coast, and also in fish stomachs, its spawning grounds were located along the northern coast of Norway from Vest-Fjord to 20°-25° East Longitude, mostly in water from 50 to 150 meters deep (but rarely from 7 to 700 m.), at a temp. of 5°-6° and salinity 34.4-35.1%. Spawning occurs from early Feb. to mid-May, with a max. in March. The larvae are carried eastward by the current and spend their littoral "whitebait" stage (35-60 mm.) along the Murman coast of Russia. Leaving this the same yr., they swim or are carried eastward and northeastward through the southern Barents Sea as far as Novaia Zemlja. As they grow older the young herring begin to swim westward, apparently with seasonal offshore-onshore migrations, and at 20-34 cm. (age IV-VIII) they have reached the Lofoten banks and spawn for the first time. After that they are not taken in the eastern Barents Sea, and between spawnings, presumably move north in the direction of Spitsbergen. The fjord type of Murman herring is not sharply distinguished from the oceanic type. Eastward from 20° E.L. the herring spawn in shallower water and at lower salinities; the farther east, the later is the spawning season, so that in the eastern Murman fjords it takes place through the summer to late September. These fjord herring are much less numerous than the oceanic form which spawns farther west; little is known of their later life history.—W. E. Ricker.

5334. Zatsëpin, V. I., i N. S. Petrova. Pitanie promyslovyykh kosiakov treski v iuzhnoi chasti Barentsova Moria. [Food of the commercial stocks of cod in the southern part of the Barents Sea.] *Trudy Polkarnyi N.-I. Institut Morskovo Rybnovo Khozaistva i Okeanografii (Repts. Polar Res. Inst. Sea Fish. and Oceanogr. Murmansk)* 5: 1-169. 26 fig. 1939.—This comprehensive study of cod feeding is based upon 12,403 stomachs examined quantitatively, 34,075 studied qualitatively, and reports on the food in about 120,000 additional stomachs, as sent in by fishermen. Most of the stomachs were from immature individuals of the 1929 and 1930 year-classes, which predominated in the fishery during the yrs. 1934-38, when most of the samples were taken. The Barents Sea cod is a bottom-dwelling and essentially piscivorous fish. The following fishes are important in its food (the percentage given in brackets is the fraction of total wt. of food): herring (17.6), capelin (16.7), young cod and haddock (18.5), polar cod (*Boreogadus saika*) (4.6), *Drepanosetta* and various other bottom fishes of the families Lumpenidae, Zoarcidae, Cottidae, etc. (4.2). Free-swimming Euphausiidae and Hyperiididae are of considerable importance (14), and some other plankton organisms are taken (2), including many jelly-fish in autumn and winter. Shrimps, prawns, etc., are of some importance (4.4), as are bottom crustaceans (5.2). Food taken varies seasonally and with the locality. Herring are eaten chiefly from Oct. to Apr. when they are near the bottom; from Feb. to June capelin are taken on their spawning migration; young cod and haddock are taken at all times of yr. but particularly in winter; polar cod are very important, locally, during autumn and winter; Euphausiidae and Hyperiididae are eaten in summer, when the former descend to deep water after spawning; bottom crustaceans

are eaten principally from July to Oct., especially on rich eastern banks. Very considerable variations exist between different yrs. in the importance of any given organism in the food, and these have, in some instances, been related to differences in behavior of the prey species associated with hydrological factors, or simply to variations in its density. The general picture of the yearly course of cod migration and feeding is as follows: I. From June to early August, cod are concentrated in the fishing areas of the central part of the Barents Sea, where they consume chiefly Euphausiidae. II. Many cod move to the eastern grounds and from Aug. to early Dec. feed on young Gadidae and bottom invertebrates. Toward the end of this period a migration to the western edge of the Barents Sea occurs, during the course of which the fish feed on polar cod, herring, and young cod and haddock. III. Immature cod feed little during Dec. and Jan., while mature ones almost completely stop eating during this their spawning season. IV. Still on the western fishing grounds, the cod feed heavily from Feb. to Apr. on herring and later capelin; in years of high bottom temperatures this extends to the central grounds as well. V. Late April and May is a time of very light feeding, occasioned apparently by a scarcity of suitable foods in the bottom waters.—W. E. Ricker.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 5302, 5522, 6149, 6181, 7891, 7895, 7903)

5335. Crespo, J. A. Observaciones sobre etología y desarrollo de nuestra torcacita *Columbina picui picui* Temm. [Observations on ethology and development of a wild pigeon.] *Rev. Argentina Zoogeogr.* 3(3): 97-102. 3 fig. 1943.—This article contains the author's conclusions concerning the birth and development of 2 *C. p. picui* near Buenos Aires (Sept., 1943). Construction of nest, laying of eggs, birth and development of young all took place within 28 days. Squabs were weighed daily; the greatest growth took place the first 2 days, in which they doubled their wt. This sp. nests 2-3 times from Aug. to May. A phenological list, with compilation of breeding dates given by various authors, is added.—J. A. Crespo.

5336. Freeburn, C. C. (*Pennsylvania Game Comm., Harrisburg.*) Proposed management of forested game lands in Pennsylvania. *Trans. North Amer. Wildlife Conf.* 10: 112-118. 1945.—Realizing the need for producing maximum annual game crops on state game lands, a long term management program was developed in Pennsylvania which principally was the outgrowth of various techniques tried on an exptl. basis. This program will include: a survey of soils, cover, food, water, topography, and wildlife populations for each tract; an extensive research project in connection with the management program to acquire badly needed information on plant successions and food producing values of various trees, shrubs, and plants for wildlife; timber removal and improvement cuttings in accordance with a fixed rotation plan on each block of land. Release cuttings will be expanded to increase the production of grapes and other food producing plants; practical erosion control and soil fertility programs will be developed as rapidly as possible and known soil erosion control measures, especially controlled farming, will be applied in connection with all food plots and share crop programs. Game refuges will be materially reduced in size or shifted to more suitable territory nearby. Since these sanctuaries have served their major usefulness in forest country as far as big game is concerned, none will be established in such localities in the future except where they will benefit small game. Water impoundments will be made where feasible to benefit waterfowl and fur-bearers. On larger tracts, roads will be opened for the convenience of the hunting public. Trails leading from such trunk roads will also be established to make interior portions of the land accessible. All roads other than such trunk roads will remain closed to vehicular traffic.—L. A. Luttringer.

5337. Gordon, Seth. (*Pennsylvania Game Comm., Harrisburg.*) Progress of the public game lands in Pennsylvania. *Trans. North Amer. Wildlife Conf.* 10: 1-8. 1945.—A detailed account of Pennsylvania's system of game refuges and public shooting grounds, now totalling nearly 840,000 acres. The Commission established its first game refuge on state forest lands in 1905, principally to provide protection

for deer which were very near extermination in the Commonwealth at the turn of the century. In 1915, the Legislature authorized the Commission to lease lands for refuges and hunting ground purposes. In 1927, the hunters' license fee was increased from \$1.25 to \$2 at the request of the sportsmen. With the additional revenue the Commission expanded its land purchase and management programs. In 1936 a cooperative farm-game program was established to improve hunting conditions for small game near populous centers. Under it, landowners lease the hunting rights on their properties to the Commission in return for the protection they receive from careless and unscrupulous hunters. A minimum of 1,000 acres is required for any one project and  $\frac{2}{3}$  of it must remain open to public shooting. Safety refuges averaging 8 acres are established. The projects are stocked with ringnecks and rabbits. Predatory birds are kept under control. Efforts are made to provide as much natural food and cover as possible. Strips of grain near coverts are purchased from farmers. The projects are patrolled regularly during the hunting season. During the last 8½ yrs., the Commission expended \$200,000 for the creation, establishment, protection, development, and maintenance of the projects, or an average of about \$23,500 a year. In addition to this, during the year 1943, \$27,641 worth of rabbits, ringnecks and quail were planted on the project areas and \$3,000 was paid to farmers for raising ringnecks. Consequently, the cost to the Commission, paid from the sportsmen's license fund, amounted to \$54,142 for the year 1943 as against \$112,818, the estimated value of the game killed by sportsmen on the various project areas that year. As of Jan. 1, 1945, the Pennsylvania Game Commission had under its control for wildlife purposes a total of 1,063,708 acres, of which 199,910 acres were closed and 863,798 acres were open to public hunting.—L. A. Luttringer.

5338. Rowe, L. S. (Director). Report on activities of the conservation section, division of agricultural cooperation, Pan American Union (1943-1946). 148p. 2 maps, 4 pl. Pan American Union: Washington, D. C., 1946.—A general review of the status of renewable resources, particularly of Mexico, Guatemala, Chile, and Venezuela, calling attention to a dangerous degeneration of land and its derivatives, including timber, water, and wildlife. The concept of the interrelationship of these resources is emphasized throughout discussions of cause, effect, and cure, and the influence on economic and social patterns. Eight appendices present more detail on specific subjects, especially Mexican natural resources, which include a bibliography of 314 titles. Also listed are the texts on management of national parks in Chile, guano investigations, the resolution on conservation adopted at the Oct., 1945, Mexican Social Sciences Congress, and the Mexican law on conservation of soil and water.—W. O. Nagel.

5339. Warren, Carl R. (*Ohio Div. Conserv., Columbus.*) A waterfowl banding study on a new impoundment. *Trans. North Amer. Wildlife Conf.* 10: 319-325. 1945.—During the 1939-41 period, 3228 ducks of 9 spp., mostly black (*Anas rubripes*) and mallard (*A. platyrhynchos*) ducks were banded on the newly-impounded (1938) 1350 surface-acre Charles Mill flood-control reservoir in Ashland County, Ohio. The significance of 633 returns and 1634 repeats of banded ducks in relationship to both the Ohio as well as the continental migratory waterfowl situation is discussed. Since most of the returns (413 total of both blacks and mallards) were from Ohio, it is demonstrated that the Charles Mill refuge provided for improved waterfowl hunting within the state. The returns from without the state indicate that ducks follow essentially the major flyways.—C. R. Warren.

5340. Weaver, Richard L. (*Audubon Nature Center, Greenwich, Conn.*) Ecology as the basis for training teachers in nature and conservation education. *Trans. North Amer. Wildlife Conf.* 10: 215-216. 1945.—The teachers of conservation and nature study today are being trained much more effectively than ever before to understand the principles of wildlife management, soil erosion control, and forestry conservation, by using ecology as the basis of instruction. To see and understand the interrelationships of plants and animals, the unique habitat requirements, the role of predation, the ever-changing balance of nature, the continuous succession of plants and animals, is to appreciate that one

must be more than a taxonomist and a classroom biologist. Fieldwork, personal observation, first hand observation, and on-the-spot studies are in order. Any natural area, such as the Audubon Nature Center at Greenwich, Connecticut, even though in a densely settled area, can provide an opportunity for such studies and should be the solution for a "place

to use ecology as the basis for nature and conservation instruction".—R. L. Weaver.

5341. Westermann, J. H. Wild life conservation in the Netherlands empire, its national and international aspects. In: *Science and Scientists in the Netherlands Indies* 417-424. 4 fig. Chronica Botanica Co.: Waltham, Mass., 1945.



# BIOLOGICAL ABSTRACTS

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## BIOGRAPHY, HISTORY AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 8086, 8157, 9201, 9228)

### HISTORY

7914. Alvarez, W. C. Was there sick headache in 3000 B. C.? *Gastroenterol.* 5(6): 524. 1945.—In the Sumerian account of the Deluge, there are references which may be interpreted to mean that the writers suffered from migraine and hoped to be rid of it in the Abode of the Blessed.—A. M. Snell.

7915. Lebon, J. H. G. The face of the countryside in central Ayrshire during the eighteenth and nineteenth centuries. *Scottish Geogr. Mag.* 62(1): 7-15. 5 maps. 1946.—Details the change in a few central Ayrshire parishes from many small holdings to larger and fewer farms, to general land improvement, division of lands into rectangular fields of approx. equal area and improvement of shelter-belts. Labor has been reduced by modern dairy-farming methods and many rural cottages and small farm steadings have disappeared.—C. E. Foister.

7916. Rudolph, Richard C. (U. Toronto, Canada.) Early Chinese references to fossil fish. *Isis* 36(3/4): 155. 1946.—It has been shown recently that the Chinese philosopher Chu Hsi referred to fossil shell fish around 1200, but Chang Hung-chao has quoted (1927) from the Shu ching chu by Li Tao-yüan (d., A.D. 527) a reference to stones found in Hunan Province which, when split, show figures of fish with scales, heads, and tails as if carved on the stone. Other references to fossil fish are dated 860 and 1133. The latter gives more details, expresses a modern view of their origin, and mentions faking of these fossils because of their supposed magic properties. Beginning in the 4th century A.D. there are numerous references to fossil shell fish of the brachiopod genus *Spirifer* in many provinces. They were supposed to be able to fly and to have medical value.—R. P. Bigelow.

7917. Spencer, Robert F. (U. California, Berkeley.) The cultural aspects of eunuchism. *Ciba Symposium* 8(7): 406-420. Illus. 1946.—It is thought that castration originated among primitive people who discovered that gelding of animals increased their size, strength and docility and enhanced palatability of their flesh. There is evidence that Neolithic man of Asia Minor (ca. 4,000 B.C.) had begun domestication of cattle, sheep and pigs. In n.e. Brazil the Caribs castrated human war captives and kept them for increase in size and tenderness of flesh. This is the only known instance of human castration as a custom in the New World. In the Old World the earliest recorded mention of eunuchs is in the Babylonian Code of Hammurabi (ca. 2,000 B.C.). Castration appears to have been used here as a punishment for sexual crimes and for the same reason in Egypt (1200-1085 B.C.) and later in China. The Assyro-Babylonian region offers the first evidence of eunuchism as a social institution, a custom unknown in primitive societies. In Mesopotamia there were 3 groups of eunuchs, punished sexual criminals, royal servants and priests. From Mesopotamia the custom probably was carried to China and India. Since Asia Minor was the center of origin, it was here that the effects of castration were intensified. Among the royal servants and priests, some eunuchs rose to the greatest power and held high military and civil positions. Many eunuchs of all nations that promoted the custom were men of outstanding mental ability and dominant character. The various aspects

of the rise of eunuchism in the Near and Far East are discussed with outstanding examples of famous, colorful characters and numerous historical illustrations. The eunuch priest survived in Christianity in individual cases where full renunciation of temptations was sought and in certain extreme ascetic cults (e.g., Valesians, 3d and 4th cent.). It has even existed until modern times when, in spite of expressed papal disapproval, small boys were castrated to keep them as sopranos in some Italian church choirs. The custom was finally terminated by Pope Leo XIII (1878-1903). 42 refs.

### BIBLIOGRAPHY

7918. Coton et Fibres Tropicales. Volume 1, Number 1, June 1946. Directeur General: Julien Gautier. Editorial Committee: Angliviel de la Beaumeller, Georges Bousset, Bui Xuan Nhuan, Louis Chauserie-Laprée, André Dogon, Marcel Griveau, André Kopp, Jean Lhuillier, Frédéric Maillard, Guy Roberty, Camille Roches, Olivier Roehrich, Edouard Senn, and Raymond Thiebaut. Quarterly. 32 pages (3 articles) in the first issue. Published by the Institut de Recherches du Coton et des Textiles Exotiques, 29, rue d'Artois, Paris 8°, France. Subscription price, 450 fr.—The following papers comprise this issue: La guerre et le coton by Edouard Senn; Observations et particularités de la floraison du cotonnier à Bouaké (Cote d'Ivoire), by Jacques Miège; and Technologie de la ramie; De la plante à la fibre textile, by Bui Xuan-Nhuan.

7919. Fulton, John F., and Madeline E. Fulton. The centennial of surgical anesthesia: an annotated catalogue of books and pamphlets bearing on the early history of surgical anesthesia. xv+102p. Henry Schuman: New York, 1946. Pr. \$4.

7920. Pacific Science. Volume 1, Number 1, January 1947. Editorial Board: A. Grove Day, Editor; Ervin H. Bramhall, Vernon E. Brock, Harry F. Clements, Robert B. Dean, Charles H. Edmondson, Harvey I. Fisher, Frederick G. Holdaway, Maurice B. Linford, A. J. Mangelsdorf, Harold St. John, and Chester K. Wentworth. Quarterly. 4 articles (62 pages) in the first issue. Published by the University of Hawaii, Honolulu 10, Hawaii. Subscription price \$3.—This new journal is devoted to the biological and physical sciences of the Pacific Region. The following papers comprise this issue: The history, present distribution, and abundance of sandalwood on Oahu, Hawaiian Islands, by Harold St. John; The Tsunami of April 1, 1946, in the Hawaiian Islands, by G. A. MacDonald, F. P. Shepard, and D. C. Cox; Dolomitization in semi-arid Hawaiian soils, by G. Donald Sherman, Yoshinori Kanehiro, and Charles K. Fujimoto; and Notes on the red-billed Leiothrix in Hawaii, by Harvey I. Fisher and Paul H. Baldwin.

7921. Anonymous. Catalogue of the Amani library. 2nd ed. [With a foreword by R. E. Moreau and A. G. G. Hill] 118p. The East African Agric. Res. Sta.: Amani, Tanganyika Territory, East Africa, 1941.

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7922. Baglioni, S. Giacinto Cestoni (1637-1718) parasitologo. *Riv. Parassitol.* 6(1): 1-12. Portrait. 1942.—Cestoni's discovery, made in 1687, of an *Acarus* as the etio-

logical agent of scabies may be considered as the basis of modern parasitology. The author demonstrates that the letter to F. Redi signed by Bonomo, a physician of Leghorn, in which the parasitological etiology and infectivity by contact of scabies was pointed out for the first time, is really the result of Cestoni's researches. A fine comparison was made by the latter between the infestation by acari from man to man and that by teredini (parasites of the wood of ships) from ship to ship. An interesting review is reported on polemics that arose among his contemporaries after Cestoni's discovery.—*Gabriele Gramiccia.*

7923. Beccari, N. *La vita e l'opera di Giulio Chiarugi.* [Life and works of Giulio Chiarugi.] *Arch. Ital. Anat. e Embriol.* 50: 232-257. 1946.—An obituary notice and an account of the work as investigator and teacher of one of the best known Italian anatomists, author of the most important Italian text books on human anatomy and of the first Italian treatise on human embryology. A complete list of his publications is included.—*N. Beccari.*

7924. Beurlen, Karl. Ferdinand Broili 70 Jahre alt. *Forsch. u. Fortsch.* 20: 93-94. 1944.—An appreciation of the scientific work of the German paleontologist F. Broili, on the occasion of his 70th birthday.—*O. H. Schindewolf.*

7925. Broili, Ferdinand. Ernst Freiherr Stromer von Reichenbach zum 70. Geburtstag. *Forsch. u. Fortsch.* 17(16/17): 199-200. 1941.—Epitome of the work of the German paleontologist Ernst Stromer von Reichenbach on the occasion of his 70th birthday.—*O. H. Schindewolf.*

7926. Broili, Ferdinand. Franz Kossmat. *Sitzungsber. Math.-nat. Abt. bayerisch. Akad. Wiss. München* 1942: 81-82. 1942.—Obituary of the German geologist and paleontologist Franz Kossmat (1871-1938).—*O. H. Schindewolf.*

7927. Caporiacco, Lodovico di. Leopoldo Granata. [Obituary.] *Boll. Zool. Agrar. e Bachicoltura.* [Turin] 11(1/2): 41-47. 1940.

7928. Colosi, G. Daniele Rosa. *Monitore Zool. Ital.* 55: 45. 1946.—A short obituary notice of the famous Italian zoologist, founder of the Hologenesis theory.—*N. Beccari.*

7929. Colosi, G. Giulio Chiarugi. *Monitore Zool. Ital.* 55: 53-54. 1946.—A short obituary notice of one of the best known Italian human anatomists.—*N. Beccari.*

7930. Davis, Harry T. Dr. Clement Samuel Brimley. *Herpetologica* 3(4): 128-130. Portrait. 1946.—Dr. Clement Samuel Brimley, a native of England, spent his adult life in N. Carolina where he did notable pioneer work in the natural sciences. Foremost were his works in herpetology, ornithology, entomology and mammalogy. A bibliography of his numerous herpetological publications is included.

7931. Götzinger, Gustav. Hermann Vettors. *Jahrb. Reichsanst. Bodenforsch.* 62: 575-591. Portrait. 1941-1944.—Obituary for the Austrian geologist and paleontologist, with complete bibliography.—*O. H. Schindewolf.*

7932. H.(aecker), F. W. Albert M. Brooking. *Nebraska Bird Rev.* 14(1): 27-28. 1946.—In charge of "House of Yesterday", municipal museum at Hastings containing 4500 bird specimens.—*O. A. Stevens.*

7933. K., N. B. Obituary: E. C. Stuart Baker. *Jour. Bombay Nat. Hist. Soc.* 45(2): 212-220. 1 pl. 1945.—Baker died Apr. 16, 1944. A complete bibliography of his publications is given; most of them deal with ornithology.—*W. F. Hollander.*

7934. Krause, Paul Gustaf. Friedrich Kaunhowen. *Jahrb. Reichsanst. Bodenforsch.* 61: 347-357. Portrait. 1940-1941.—German geologist and paleontologist, who among other papers published a monograph on the gastropods of the Cretaceous of Maastricht.—*O. H. Schindewolf.*

7935. Miller, Genevieve. (Johns Hopkins U., Baltimore, Md.) William Beaumont's formative years. Two early notebooks 1811-1821. 87p. Portrait, 21 fig. Henry Schuman, New York, 1946. Pr. \$6.—Part I is Beaumont's Medical Notebook, containing excerpts from medical authors, case histories, army medicine, and prescriptions. Part II, General Notebooks, includes literary excerpts, war and travel diaries. These notebooks are now at Washington Univ. School of Medicine, St. Louis, Mo., where most Beaumont documents are preserved. Miss Miller's introduction, critical annotations and well selected illustrations from a wide range of sources make Beaumont a vivid personality. The

book enables the reader, without consulting the originals, to learn the factors which prepared this self-educated physician to recognize and take advantage of the opportunity presented by the gastric fistula of Alexis St. Martin. He had the needed spirit of inquiry and knowledge gained by personal experience with patients, which enabled him to carry out his remarkable expts. Despite his French name, Beaumont was born on a farm in Connecticut of old New England stock, attended the village school and worked on the farm. When 21 he went to Champlain, N. Y. where he taught school for 3 yrs. and read medical books borrowed from a Burlington, Vt., physician. Later (1810) he entered the home of Dr. Benjamin Chandler, St. Albans, Vt., as his apprentice in medicine and in 2 yrs. obtained a license to practice medicine. His notebooks begin with this period. When the war of 1812 started, with an urgent need for doctors, he joined the army at Plattsburg as surgeon's mate and was one of 7 especially commended for their services. After the war he took up private practice at Plattsburg. In 1819 he was reinstated in the army and was sent to Mackinac, Mich., in the northern wilderness described in his notes. It was here in 1822 that Alexis St. Martin came under his care. The numerous quotations and his own reflections recorded in his General Notebook give a clear picture of Beaumont's personality and philosophy of life. His medical notes are probably fair examples of the average equipment of the physicians of his day.

7936. Sherrington, Charles. (Cambridge U., England.) The endeavor of Jean Fernel, with a list of the editions of his writings. 223p. Illus. Cambridge Univ. Press: England, 1946. Pr. \$2.80.—Jean Fernel (1497-1558), French physician and physiologist, took an active part in the Renaissance and was called "the modern Galen." A tabular chronology of his period shows his position in relation to some great world events and important contemporaries. His book, "The Natural Part of Medicine" (1542) bridged the 13 centuries from Galen's "On the Use of the Parts." It was repeatedly issued in Paris, Lyons and Venice. He changed the name to "Physiology" and for more than a century it was the leading text until Harvey's discovery of the circulation put it out of date. Guillaume Plancy, a young physician, Fernel's assistant, who lived for 10 yrs. in his home, wrote a short "Life" which is the principal biography giving an intimate view of his beloved master. Plancy's "Vita Fernelii" was first printed in 1607, 49 yrs. after Fernel's death and 33 yrs. after Plancy's. A translation of the Latin Leyden edit. (1656) is given (p. 120-170) with helpful marginal annotations by Sherrington, which can be read as an epitome of the biogeography. The whole book is a scholarly, interesting study of this period of medical history, with side lights on dialectics, religious warfare, social conditions and significant historical changes.

7937. Telepnef, Basilio de. Paracelsus. A genius amidst a troubled world. 93p. Zollikofer and Co.: St. Gallen, Switzerland, 1945. Pr. \$1.20.—An essay on the life and main works of this many-sided, great Swiss physician, humanitarian, scientist and philosopher. The introduction is by Dr. J. Strebel who has done much research on Paracelsus. Paracelsus (1493-1541) was born in Switzerland, the son of Wm. Bombastus Hohenheim, and was named Philip but later baptized Theophrastus. The name Para-Celsus was assumed when he received his medical degree in medicine at Ferrara in Italy, indicating that he had gone above and beyond the great Latin physician Celsus. His father was a versatile Swiss physician and scientist, devoted to the service of the needy and a traveller, during the last 10 yrs. of his life, physician and also teacher of practical metallurgy in the mining school at Villach in Carinthia, Austrian Tyrol. Paracelsus inherited from his father his love of humanity, science, medicine and travel. Probably expts. in the refining of metals turned his attention to chemistry which he later introduced into medicine. At 14 yrs. of age he went to Germany and studied some 4 yrs. at several universities, but finally took his B.A. degree in Vienna. After his father's practical, honest work among sick miners, the ignorance and artificiality of many German medical men led Paracelsus to call them "sham physicians." He was always intolerant of hypocrisy and fraud. Only 18 when he left Vienna, he began a 12-yr. period of wanderings during which he encircled Europe, going as far north as Lapland, through Sweden, part of Russia,

the British Isles, Holland, France, Spain, Italy, Greece and into Egypt, Palestine and Turkey. His journeys were adventurous and often extremely hazardous; he was captured by Tartars in Russia but released because of respect for his healing powers. In every country he studied at the famous medical schools and sought practical knowledge from all classes of persons, from the most learned doctors to the humblest bath keeper or midwife. Excerpts from his writings "Infirmary Book" (1529) and "Surgery Book" (1536) show how diligently he tried to increase his information and experience. In his great book "Astronomia Magna" (1537-39), he makes some very remarkable statements which appear to predict the telephone, telegraph, aeroplane and radio. In "Das Buch Meteorum, etc." he wrote "For what is so mighty, so violent, and so wondrous too as a ray in its effect and action." Was Francis Bacon (1561-1620) influenced by Paracelsus when he wrote the "New Atlantis" 100 yrs. later? Did van Helmont (1577-1644), discoverer of CO<sub>2</sub>, know of his work on gases? His unconventional life, intolerance and antagonism to traditional standards resulted in many conflicts with authorities and led to ups and downs in his restless life.

7938. Wilckens, Otto. *Kleine Geschichten um Leopold v. Buch. Geol. Rundschau* 34: 278-279. 1943.—Short stories from the life of the famous geologist and paleontologist, Leopold von Buch.—O. H. Schindewolf.

7939. Yerkes, Robert M. (Yale U., New Haven, Conn.) Walter Bradford Cannon. *Psychol. Rev.* 53(3): 137-146. 1946.—An appreciation of Cannon's research contributions and of his personal qualities.—S. S. Marzolf.

7940. Zabel, H. E., and Stephen S. Visher. (Indiana U.,

Bloomington.) *Living Indiana scientists, a statistical study. Proc. Indiana Acad. Sci.* 55: 154-162. 1946.—Of the persons sketched in American Men of Science, 1944, Indiana was the birthplace of 1,288, the place of college training of 1,215, of post-graduate training of 502; of the 655 living in Indiana in 1943, about 2/3 are employed by universities and colleges, 1/3 by industrial firms. Purdue U. employed 198, Indiana Univ. 97, all other educational institutions 160. The distribution of birthplaces reveals that in proportion to population in 1900 the counties containing colleges or universities yielded relatively many. As compared with most other states, Indiana's yield is notable, but Indiana employs less than 1/3 as many. Indeed, of starred scientists living in 1943, 31 were born in Indiana but only 8 actively employed there. In the college training, leaders are Indiana Univ. with 331 alumni, Purdue 253, DePauw 138, Wabash 95 and Earlham 71. As compared with Kansas, Iowa, Minnesota and Massachusetts, a larger percentage of Indiana's scientists are chemists (27%), physicists (9.7) or botanists (7.9) than in the other 4 states, but a smaller percentage are zoologists, geologists, agriculturists or in medicine.—S. S. Visher.

7941. Anonymous. *Obituary: Dr. F. R. Cowper Reed. Sci. and Culture* 11(12): 681. 1946.—Dr. Reed had written more than 20 monographs devoted to the Paleozoic fauna of India; the subjects of these are briefly listed.—C. A. Reed.

7942. Anonymous. *Rouwnummer. [Mourning issue.] Tijdschr. Diergeneesk.* 70(9): 1945.—This entire issue was dedicated to veterinarians who died as a result of the war. The number of known dead is 34, most of whom died in concentration camps or for violations of Nazi law.—Chas. H. Haasjes.

## EVOLUTION

ALFRED EMERSON, *Editor*

(See also: Hypophysis modified in domestication, swine, 8504; Variations in microorganisms, 9131; Phylogeny of Arachnomorpha, 10627; Endemic fishes of N. C., 10760; Evolution of the fishes, 10773; Evolution of goodeid fishes, 10779)

7943. Dehaut, E-G. Sur l'évolution des dessins tégumentaires mammaliens. *Bull. Mus. Nation. Hist. Nat. [Paris]* 15(2): 75-78. 2 fig. 1943.—A case of "inversion" in the orthogenesis of the color pattern in an African antelope (*Cephalophus doriae*), characterized by an antero-posterior development.—Ovila Fournier.

7944. Gray, Stephen W. Relative growth in a phylogenetic series and in an ontogenetic series of one of its members. *Amer. Jour. Sci.* 244(11): 792-807. 4 fig. 1946.—Relative growth curves of the type  $y = bx^k$  are presented for 24 spp. of ceratopsians and for an ontogenetic series of *Protoceratops*. A number of skull dimensions are compared phylogenetically and ontogenetically. The phylogeny revealed agrees with Lull's arrangement of the family. Certain dimensions show different values for  $b$  and  $k$  in different phyletic lines while others do not. The former may be considered as having diagnostic taxonomic value for units of less than family rank, while the latter remain constant throughout the sub-order. One form (*Styracosaurus*) showed characteristics of 2 different phyletic lines depending upon whether the spines of the crest were included in the measurement of the crest or not. The highest value for  $k$  was found to be 1.96 for the distance between horn cores in relation to beak-orbit distance. Nasal horns show a negative value for  $k$ .—S. W. Gray.

7945. Heitz, E. Über einige Fragen der Artbildung. *Arch. Julius Klaus-Stift.* 19(3/4): 510-528. 5 fig. 1944.—Discusses the role of selection in evolution using Naegeli's distinction between adaptive and organizational characters. Plasma mutations occasionally arise in species and races of plants. Transplantation experiments between fish blastulae and amphibians show that the plasma differences cannot be very fundamental. Crosses of plant species show that many specific and some generic characters are Mendelian differences. As many as 34 exist between two species of *Chlamydomonas*. Mendelizing characters are often not only specific but generic, or even family or ordinal. Numerous cases are cited in flowering plants. Zygomorphy is a feature of some families, subfamilies, genera or of certain species in a genus. In the liverwort *Marchantia*, mutations of every grade, species, genus, family, can occur. But many of these are loss muta-

tions, loss of chambers or assimilating filaments or reproductive heads, the loss being quite a different process from that by which these organs were developed. Pleiotropic genes are used to account for Darwin's "law of correlation". The peristomes of mosses are analyzed in relation to the selection principle. Numerous mutations were obtained by x-raying *Pellia neesiana*. Most of the clones with chromosome translocations showed no morphological change from normal even after long cultivation, indicating that gene changes are generally not position effects.—R. R. Gates.

7946. Hennig, E. Organisches Werden, paläontologisch gesehen. *Palaeontol. Zeitschr.* 23: 281-316. 1944.—Organic evolution proceeds in definite directions and therein shows a remarkable discrepancy with the unsteady environmental factors. It is therefore concluded, that life is determined by immanent laws of its own. The lower, primitive organisms are not replaced by those of higher organization but coexist with the latter, and often survive them. The struggle for existence alone cannot explain this phenomenon. The increase of growth is said to be one of the most important propelling forces of metabolism. Phyletic evolution goes on in cycles or large rhythms with different reactions. It passes in many parallel lines, oligophyletically. The idea of teleology is denied; evolution is driven on from its very beginning, not determined by its end. Lamarckian factors must be admitted, in the author's opinion.—O. H. Schindewolf.

7947. Kuhn, Oskar. Die Deszendenztheorie. Eine kritische Übersicht. *Zeitschr. Kathol. Theol.* 67: 45-74. 1943.—The author, a radical opponent of the theory of descent, claims that the fossil faunas and floras show only a succession in time but no true evolution. The Algonkian fossils are reported to be the oldest organisms and since among them all types of invertebrates are already present, a successive evolution from lower to higher organization is denied. The single types of animals and plants are not connected with one another. The organisms, the special form of matter represented by them is in the author's opinion solely determined by entelechy, and therefore every theory of descent operating with external factors must fail. The idealistic morphology is said to be the only justified aim of biological research.—O. H. Schindewolf.



7948. Pike, F. H. (Columbia U., N. Y. C.) The biogenic law and the phylogeny of the nervous system. *Anat. Rec.* 96(4): 85-86. 1946.—An abstract.

7949. Pike, F. H. (Columbia U., N. Y. C.) Degeneration of the primitive embryonic nervous system and the ancestry of vertebrates. *Anat. Rec.* 96(4): 86. 1946.—An abstract.

7950. Van der Horst, C. J. (U. Witwatersrand, Johannesburg, S. Africa.) Revolution in evolution. *S. African Jour. Sci.* 42: 62-69. 1946.—Studies in the comparative anatomy of mammalian hair and the trophoblast throw light on evolutionary processes. "Organisms do not shrink from acting in a revolutionary way in their strivings for perpetual and irresistible progress."—G. W. Sinclair.

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 7992, 7995, 7997, 7998, 7999, 8011, 8028, 8206, 8210, 8424, 8431, 8512, 8708, 8910, 8947, 8987, 9654, 9680, 9993, 10166, 10189, 10535, 10544, 10549, 10564, 10566, 10678, 10810)

### GENERAL

7951. Frey-Wyssling, A. Über Genbau und Gengröße. *Arch. Julius Klemens-Stift.* 19(3/4): 451-456. 2 fig. 1944.—Using different estimates of gene size, the author concludes that genes are in 2 parts (pheron and agon), corresponding to the enzyme and co-enzyme in an enzyme system, but that the working distance of a gene is much greater than that of an enzyme, the former being of the order of 40-80 atoms, the latter 1000 atoms. This bearer-hypothesis, in which the units (genes or enzymes) are globular, is contrasted with the fibrillar hypothesis based on paracrystalline virus proteins and such proteins as keratin or collagen, and is in agreement with the fibrillary theory of chromosome structure. It is suggested that the globular and fibrillar theories should be combined in forming a theory of protoplasmic and chromosome structure.—R. R. Gates.

7952. Lettré, Hans, und Marianne Albrecht. (U. Göttingen und Allgemeines Inst. gegen die Geschwulstkrankheiten im Rudolf Virchow-Krankenhaus, Berlin, Germany.) Prüfung einiger Alkaloide auf eine Mitosegiftwirkung. [Study of the mitosis poisoning action of some alkaloids.] *Hoppe-Seyler's Zeitschr. physiol. Chem.* 281(5/6): 133-138. 1944.—The alkaloid colchicine, a series of derivatives prepared from it, and a series of similar synthetic compounds are active mitosis poisons, as determined by their effects on the growth of chicken heart fibroblasts. These compounds contain a suitably substituted  $\alpha$ , $\beta$ -diphenylethylamine group (stilbylamine group). It was found that 25 alkaloids which do not contain this group do not act as mitosis poisons. The alkaloids with the stilbylamine group can be divided into: 1) The colchicine type; 2) the papaverine type; 3) the berberine type; and 4) the chelidonine type. The only alkaloid of the 1st type available to the authors was apomorphine, and it showed no action on mitosis in a dose of 75  $\gamma$  per ml. of culture medium. Of 16 compounds of the 2d type tested only narcotine acted as a mitosis poison. None of the compounds of the 3d type tested acted as mitosis poisons. Compounds of the 4th type which are mitosis poisons are: chelidonine, homochelidonine and methoxychelidonine. Chelerythrine and sanguinarine, which are hydrogenation products of chelidonine, have no action on mitosis. Further study is needed to det. what constitutional factors make the alkaloids active mitosis poisons.—A. B. McCoord.

7953. Petrik, Frank G. (Homer Folks Tuberc. Hosp. Lab., Oneonta, N. Y.) Atypical acid-fast microorganisms. II. Desoxyribonucleic acid content. *Jour. Bact.* 51(4): 539-545. 1946.—The results of this study confirm the probable presence of desoxyribose type nucleic acid in all strains of mycobacteria and that strains of known virulence for animals may have a greater content than the so-called avirulent strains. The reaction for pentose obtained with orcinol reagent indicated that ribonucleic acid was also present in 3 strains studied. The nucleic acids of *Mycobacterium phlei* consist largely of the desoxyribose type, which differs from Coghill's finding of the ribose type. The values of the N:P ratios are consistent with that required by theory for the tetranucleotide structure of nucleic acid. The bond between the nucleic acid and protein in mycobacteria apparently is nonpolar since it was necessary to treat the nucleoprotein with alkali before the nucleic acid could be precipitated free of protein.—P. L. Cummings.

7954. Prokofieva-Belgovskaja, A. A. (Inst. Genetics, Acad. Sci. USSR.) "Mother" and "daughter" chromosomes. *Jour. Heredity* 37(8): 239-246. 6 fig. 1946.—The significance of heterocyclic systems in paired nuclei is

a dominant feature of this study. Observations on cells of potato tubers are presented which are interpreted as indicating that the 2 chromosomes arising during mitosis differ in their physico-chemical properties, and are to be regarded as mother and daughter. It is concluded that the differentiation of the nuclei of lower plants and protista in regard to their sex is brought about by the separation of the elements of the system of "maternal-daughter chromosomes." The difference in the cyclical conditions of sister nuclei determines the difference of their sex tendency. The heterocyclicity arising in the process of self-reproduction of the components of the system "maternal-daughter" chromosomes was the initial step in the evolution of sex. The results of this study are considered to confirm Darlington's conclusion that "there is an absolute distinction between a parent and a daughter thread in the reproduction of the chromosomes."—L. M. Dickerson.

### PLANT

7955. Berger, C. A., and E. R. Witkus. (Fordham U., N. Y.) Polyploid mitosis as a normally occurring factor in the development of *Allium cepa* L. *Amer. Jour. Bot.* 33(10): 785-787. 14 fig. 1946.—In seedlings of *A. cepa* ranging from 10 to 40 mm. in length, some of the large cells become tetraploid by a process of double chromosome reduplication in the resting stage. The cells undergoing this process are found in the transition region between root and shoot and in the large mesophyll cells of the cotyledon. These cells undergo one mitotic division as tetraploids.—C. A. Berger.

7956. Bhaduri, P. N., and A. K. Sharma. (Calcutta U., India.) Cytogenetics of *Datura fastuosa* L. *Bull. Torrey Bot. Club* 73(5): 438-450. 26 fig. 1946.—*D. fastuosa* (*D. metel*) is common in India, in black and white vars., the former nearly constant, the latter variable. Both types have  $2n = 24$  chromosomes, which are alike in morphology except that the black var. has 3 pairs, the white 4 pairs, of nucleolar constrictions. There are correspondingly 3 and 4 pairs of nucleoli, respectively, in the 2 vars. Apparently a small nucleolar chromosome has been duplicated in var. *alba* while the smallest chromosome is duplicated in the black var. In *alba* some chromosomes fail to separate in premeiotic mitosis, producing P.M.C.s with more or less than 24. This results in gametes with  $n = 9, 10, 11, 12, 13$  or 14, some gametes with 12 having one pair duplicated and another deficient. Thus may also arise trisomics, tetrasomics,  $2n-1$  and other genotypes.—R. R. Gates.

7957. Camara, A. Rutas e rearranjos cromosómicos induzidos pelos raios X. [Chromosome breakages and rearrangements induced by X-raying.] *Scientia Genetica [Torino]* 1(4): 339-353. 1940.—Chromosome mutations have been induced in *Aloe arborescens* by X-raying with dosages ranging from 100 to 700 r units. Analysis of the collected data shows that there are weak points in the chromosomes where breakage is more likely. By varying the wave length, differences are obtained in proportionality to dosage, and the author suggests that this may be due to the effect of "solarization", a phenomenon known to photographers. As a rule, breakage takes place first and is followed by reunion of broken ends. Translocations may sometimes occur as a consequence of the formation of chromatic bridges.—A. Buzzati-Traverso.

7958. Conard, A. Sur la substance particulière contenue dans les noyaux cellulaires de *Pinguicula vulgaris* L. [The special substance contained in the nuclei of *P. vulgaris*.] *Bull. Soc. Roy. Bot. Belgique* 73: 201-224. 1940-1941.—

A "special substance" is present in most nuclei, which shows increasing abundance as the cells become adult. The growing point has but little of it. This may take the form of chromatic plates (Feulgen positive), of plates imbedded in vacuoles (Feulgen negative) or of crystalline plates (Feulgen negative). It is formed in the assimilatory cells from products of photosynthetic activity, and from there passes to the meristem. The author believes this special substance has a nucleoproteid constitution. The nucleolus and thymonucleic acid seem of major importance in the formation of the chromatic plates (Feulgen positive). When the hibernacula become quiescent, the chromatic plates disappear and thymonucleic acids seem to be lacking.—*Ray Bouillenne*.

7959. Conrad, V. Sur la pathologie de la mitose. [The pathology of mitosis.] *Bull. Soc. Roy. Bot. Belgique* 74: 54-86. 1941-1942.—The action of cold and pyridine on the cell divisions of *Deganya maxima* was studied. For study of the effects of cold, samples were taken from a pond at different intervals while the pond was covered with ice. As examinations were on fresh samples, the chromatic constituents were not studied. The doses of pyridine employed are not indicated. Cold accelerates prophase, retards anaphase, and induces bilateral rupture of suspensors; pyridine action results in vascular precipitate, rupture of suspensors, prolongation of anaphase, inhibition of plasmodiesteris, irregular prophase and metaphasic figures, and transformation of anaphase into pseudo-amitosis.—*Ray Bouillenne*.

7960. Guillaumond, A., et R. Gautheret. Recherches sur la coloration vitale des cellules végétales. [Vital staining of plant cells.] *Rev. Gén. Bot.* 53: 25-45; 80-96; 121-144; 1946.—Acid dyes generally do not penetrate living cells: conversely, basic dyes may for a while become fixed on cytoplasmic or nuclear constituents, and are later excreted into the vacuolar contents; less toxic dyes, neutral red, neutral violet, Nile blue, bismarck brown, methylene blue, cresyl blue, accumulate in vacuoles of growing root tips and stain the vacuolar contents, thus facilitating the study of the development of the vacuolar system. Root tips continue to grow in neutral red at 200 mgms/l. Methylene blue, chrysoidine, bismarck brown, basic fuchsin, safranin, janus green, methyl violet accumulate in vacuoles containing phenolic compounds.—*J. Duffrenoy*.

7961. Lejour, A. Morphologie des chromosomes de *Pisum sativum*. [Morphology of the chromosomes of *P. sativum*.] *Bull. Soc. Roy. Bot. Belgique* 74: 108-124. 1941-1942.—The chromosomes show great variability, especially during metaphase. The metaphasic contractions are not synchronous. Primary constrictions are difficult to detect. Secondary constrictions are present but are not constant, so that they cannot be used for the identification of chromosomes.—*Ray Bouillenne*.

7962. Mezzetti-Bambacconi, V. Osservazioni cariologiche su alcune Lauracee. [Caryological observations on some Lauraceae.] *Scientia Genetica [Torino]* 1(4): 326-333. 1940.—Pollen mother cells show  $n = 12$  in *Umbellaria californica*, and  $n = 18$  in *Laurus canariensis*. Bivalents in the latter sp. are formed by metasynopsis. Though the Perseidae show 12 chromosomes in all the spp. studied, the Lauroidae show different chromosome numbers (12, 18, 21).—*A. Buzzati-Traverso*.

7963. Negodi, G. Contributo alla cariolologia delle Papaveraceae, Subfam. Fumarioideae, con particolare riguardo ai Generi *Dicentra*, *Corydalis*, *Cisticapnos* ed *Adlumia*. [Contribution to the cariology of Papaveraceae, subfam. Fumarioideae, and especially of the genera *Dicentra*, *Corydalis*, *Cisticapnos* and *Adlumia*.] *Scientia Genetica [Torino]* 2(1): 1-25. 1940.—Chromosome nos. of several spp. of the Papaveraceae are given: *Dicentra spectabilis*,  $n = 8$ ; *Corydalis cava*,  $n = 8$ ; *C. ochroleuca*,  $n = 14$ ; *C. lutea*,  $n = 14$ ; *C. sempervirens*,  $n = 6$ ; *C. sibirica*,  $n = 6$ ; *C. cheilanthifolia*,  $n = 6$ ; *C. ophiocarpa*,  $n = 6$ ; *Cisticapnos vescicarius*,  $n = 14$ ; *Adlumia fungosa*,  $n = 16$ . In *Fumaria* some spp. are diploid with  $n = 14$ , and some are tetraploid. A discussion follows of the probable phylogenetic relationships between the subfamilies Hypecoideae, Papaveroideae and Fumarioideae.—*A. Buzzati-Traverso*.

7964. Nybom, N., and B. Knutsson. (U. Lund, Sweden.) Investigations on c-mitosis in *Allium cepa*. *Hereditas* 33 (1/2): 220-234. 1947.—Three isomers and a crude product of the insecticide  $C_6H_6Cl_6$  and 3 synthetic types of vitamin K

were studied as regards their ability to induce colchicine-mitosis in root-tip cells of *Allium*.  $\gamma$ - $C_6H_6Cl_6$  and  $CH_3$ - $C_6H_5O_2$  induced complete c-mitosis; the other substances were more or less inactive. There seems to be a connection between c-mitotic activity and the simple physical properties of the substances, which is in agreement with the theory of the narcotic nature of c-mitosis propounded by Levan and Östergren.  $\gamma$ - $C_6H_6Cl_6$  proved not to be poisonous to *Allium* roots and may be practically applicable for the production of polyploid plants. The methylnaphthoquinone gave rise to an atypical c-mitosis having its undivided chromosomes distributed to the 2 poles of the cells. An explanation of the origin of this "distributed c-mitosis" is submitted.—*N. Nybom*.

7965. Östergren, G. (Inst. Genetics, Lund, Sweden.) Heterochromatic B-chromosomes in *Anthoxanthum. Hereditas* 33(1/2): 261-296. 36 fig. 1947.—The grass *A. aristatum* has normally  $2n = 10$ . A certain population has a variable number of heterochromatic extra chromosomes. These B-chromosomes do not pair with the normal chromosomes, but they pair very well with one another. Univalent B's are not eliminated at meiosis whereby they differ from normal univalents. At the first pollen mitosis the daughter halves of the B-chromosomes remain attached to one another and are both included in the generative nucleus. Their inheritance demonstrates that such a non-disjunction does not occur in the embryo-sacs. They cause a slight reduction of pollen fertility and plant vigour. They are regarded as belonging to the category of parasitic chromosomes (*Biol. Abstr.* 20: 7772) and are discussed in connection with related cases.—*G. Östergren*.

7966. Pease, Daniel C. (U. So. California, Los Angeles.) Hydrostatic pressure effects upon the spindle figure and chromosome movement. II. Experiments on the meiotic divisions of *Tradescantia* pollen mother cells. *Biol. Bull.* 91(2): 145-169. 45 fig. 1946.—Hydrostatic pressures have been applied to *Tradescantia* PMC as a technique for studying the structure of spindles and chromosomes and the mechanics of anaphase movement. Pressure increments progressively reduce gel rigidity, ultimately to the point of liquefaction. The effects are reversible. The first meiotic division spindle was seriously affected by 5,000 lbs./in<sup>2</sup>. pressure which also sufficed to block anaphase movement. Condensed chromosomes were significantly softened by even 1,000 lbs./in<sup>2</sup>. as indicated by an undue elongation of the kinetochore stalk. Fusion bridges became particularly obvious when 3,000 lbs. was applied. Shortening and rounding occurred at 4,000 lbs. Total fusion and rounding did not occur until pressures of 15,000 lbs. were employed. These effects were thought to be upon matrix material since uncondensed chromosomes were not affected. The fusion and rounding appeared to be a surface tension effect, and suggested the existence of a true interfacial membrane. The presence of fusion bridges allowed only a very abnormal anaphase movement at pressures of 3,000 and 4,000 lbs. Spindles re-formed de novo after the release of high pressure. To some extent the formation of traction fibers was independent of the growth of the rest of the spindle, and many abnormalities occurred. It was concluded that gel structure in the spindle is essential for anaphase movement. The traction fiber may serve as nothing more than a semi-elastic connection between the chromosome and the main mass of the spindle which, in turn, is in motion. Motion and force may be imparted by sol-gel-sol transformations, with gel being added to the central bulk of the spindle while a proportional solation goes on at the poles.—*D. C. Pease*.

7967. Raynor, Louise Adele. A cytotaxonomic investigation of *Geum*. *Cornell Univ. Abstracts of Theses* 1945: 173-175. 1946.—Cytological, genetical, and taxonomic data were collected as an aid in clarifying the natural relationships of the spp. of the genus *Geum*. 21 representatives of *Geum* were examined directly, including 10 identified spp., 2 unknowns, and 6 hybrids. 84 somatic chromosomes were regularly found in *G. magellanicum*; and a single individual of *G. laciniatum* showed  $2n = 48$ . An exceptional count in the literature of  $2n = 72$  has been reported for *G. coccineum*. Otherwise, the following spp., as well as 3 others recorded from the literature, had 42 somatic chromosomes: *G. urbanum*, *G. rivale*, *G. aleppicum*, *G. canadense*, *G. laciniatum*, *G. quellyon*, *G. radiatum*, *G. peckii*, and *G. triflorum*. The

base number is 7, the same as for the tribe Potentilleae. The chromosomes ranged in length from  $0.68 \mu$  to  $2.74 \mu$ , except that in *G. magellanicum* and *G. quellyon* they were a little shorter and broader. Meiotic chromosome behavior was normal except in some of the hybrids. *G. urbanum* and *G. rivale* produced fertile hybrids when *G. urbanum* was used as the seed parent. *G. aleppicum*, *G. canadense*, and *G. lacinia-tum* produced hybrids in various combinations. The 21 *Geum* spp. were separated into 7 groups on the basis of taxonomic, cytological, and genetic evidence. It was concluded that subgeneric categories above the rank of species are necessary to express the relationships of the species within the genus. The value of style characters for this purpose emerged in this study. The author believes that the regularly hexaploid condition in *Geum* has long been in existence.—*W. M. Bowden*.

7968. Rork, Crystal Leone. A cytotaxonomic investigation of the genus *Gentiana* and related genera. *Cornell Univ. Abstracts of Theses* 1945: 180-183. 1946.—Definite chromosome numbers were recorded for 28 spp. of Gentianaceae, including 19 spp. of *Gentiana* and 4 spp. of related genera. In *Gentiana*, 11 spp. have  $n = 13$ ; 2 spp. have  $n = 18$ ; 3 have  $n = 21$ ; 1 has  $n = 22$ ; 3 have  $n = 26$ ; and 1 has  $n = 39$ . The spp. studied represent 5 of the 19 sections of the genus. The author concludes that *Gentiana* has a primary basic number of 13, and a secondary basic number of 18. 45% of the spp. of *Gentiana* are polyploids. *Menyanthes trifoliata* var. *minor* has  $2n = 54$  chromosomes which indicates that the subfamily Menyanthoideae should be retained. In the Gentianaceae, 9 and 13 were the commonest numbers. 53% of the exactly-counted spp. (28) were polyploids. 15 of the 28 were aneuploids. Polyploidy in the Gentianaceae is apparently correlated with neither temp. nor geographical factors.—*W. M. Bowden*.

7969. Semeniuk, William. (*U. Minnesota, St. Paul*.) Chromosomal stability in certain rust resistant derivatives from a *T. vulgare*  $\times$  *T. timopheevi* cross. *Sci. Agric. [Ottawa]* 27(2): 7-20. 1947.—Ten  $F_2$  and 21  $F_3$  selections made by Pridham from the cross of Steinwedel, a soft, white *vulgare* wheat, and *T. timopheevi* ( $2n = 28$ ) were used in a study of chromosomal stability. As to chromosome number, 54 plants in 19 derived lines had approx. the normal *vulgare* number, and one had 28 chromosomes. One Steinwedel had 20 bivalents and 1 univalent. The vars. used as checks showed 1.4-11.7% of cells with univalents at metaphase I, but were relatively normal in later stages. In 15 plants representing 8 Steinwedel  $\times$  *timopheevi* lines with spring growth habit, univalent chromosomes were observed in 4.8-53.8% of the cells. Correlations were highly significant between % of metaphase I cells with univalents and the following: total abnormalities at anaphase I, metaphase II, and anaphase II; micronuclei at interphase and in spore quartets; and aborted pollen. All showed correlations high enough to be used in selection as criteria of chromosomal stability. Progeny of 6 plants differing in chromosomal stability were studied cytologically. Differences in stability are inherited as indicated by the fact that parent-offspring correlations for abnormalities at corresponding stages were highly significant and that lines differing in stability were established. Derivative lines with winter habit were chromosomally less stable on the average than those with spring habit. Two  $F_1$  hybrids between a Steinwedel  $\times$  *timopheevi* derivative line with winter habit and Premier and Merit were much more unstable than either parent. It was possible to select lines from Pridham's material which combined high chromosome stability with *vulgare* characteristics and resistance to stem and leaf rust. The % of pollen abortion may be useful to the plant breeder in eliminating many of the highly unstable lines. The frequency of micronuclei in spore quartets or microspores might be used later in the selection program to check the most desirable lines.—*C. R. Burnham*.

7970. Vaarama, Antero. (*State Hort. Inst., Piiikkiö, Finland*.) Experimental studies on the influence of DDT insecticide upon plant mitosis. *Hereditas* 33(1/2): 191-219. 4 fig. 1947.—An investigation of the effects upon root-tips of *Allium cepa* and *Trigonella foenum graecum* of DDT insecticide, ethyl alcohol and DDT + ethyl alcohol. The combined Feulgen and iodine-gentian-violet differential stain was used to distinguish nucleolus and chromatin. Pure DDT had a weak c-mitotic effect. Pure ethyl alcohol (3.3-13.3 vol. %

sol.) caused effects characteristic of partial c-mitosis. Metaphase chromosomes produce nucleolar bodies, especially in the heterochromatic telomere parts. The matrix around the chromonemata is weakly developed. The structure of the chromonema is quite clearly visible. At anaphase the sticky phenomenon occurs. The metaphase nucleoli are not residues of prophase true nucleoli but are new formations that have arisen after prophase. The cycle of true nucleoli is regular. DDT + ethyl alcohol (saturated DDT soln. + 3.3-13.3 vol. % ethyl alcohol) produces the same effects as the ethyl alcohol series, though they are more powerful and frequent. It is suggested that, besides the specific effect of ethyl alcohol and DDT, the disturbance of timing relationships between the different stages of the mitotic chromosome cycle is one of the most important causes of the described mitotic abnormalities. This disturbance is caused by the c-mitotic narcosis of the spindle apparatus with a consequently retarded division. At metaphase euchromatic, as well as heterochromatic, parts of chromosomes are already in a phase of development corresponding to telophase and resting stage. It is also suggested that the metaphase nucleoli consist of pre-nucleolar substance and are, therefore, unable to function.—*Antero Vaarama*.

7971. Wanner, H. Zytologischer Nachweis genetischer Interferenz. *Arch. Julius Klaus-Stift* 19(3/4): 537-540. 1 fig. 1944.—Discusses interference in crossing-over in relation to the spindle fiber attachment. From observations of chiasmata in *Crepis capillaris* ( $n = 3$ ) he finds no interference at the centromere, the long and short arms of the observed chromosome behaving in this respect as though they were separate chromosomes. The observed frequency of double crossovers was practically equal to expectation from theory.—*R. R. Gates*.

#### ANIMAL

7972. Ahlstrom, L., H. v. Euler, and L. Hahn. Nukleoproteide in normalen und cancerösen Zellen. IV. Schonend isolierte Desoxyribonukleinsäuren aus Zellkernen. [Nucleoproteins in normal and cancer cells. IV. Carefully isolated desoxyribonucleic acids from cell nuclei.] *Arkiv Kemi, Min. och Geol.* 22A(13): 1-14. 1946.—To secure nucleic acid preps. more nearly approaching the natural material in molecular wt., thymus and liver nuclei were isolated by the method of Dounce [see *B.A.* 17(7): entry 17969] and ground with 40 and 20 parts of water, respectively. The viscous solns. which resulted had much higher molecular wts. than those of previous preps., but caution in giving an estimate is observed because such properties as viscosity are influenced by molecular shape as well as by molecular wt. Sedimentation in the ultracentrifuge showed that the preps. were polydisperse and contained molecules of high molecular wt. These high molecular wt. preps. are believed to have resulted from the fact that the nucleic acids were not exposed to the degradative enzymes of the cytoplasm, as is the case when the whole thymus is used. This suggests that the nucleoproteins and the nucleic acids in the living cell are in a labile equilibrium.—*W. F. Bruce*.

7973. Barigozzi, C. Relazione fra numero cromosomico e grandezza nucleare in *Artemia salina* Leach. [Relation between chromosome number and nuclear size in *A. salina* Leach.] *Scientia Genetica [Torino]* 2(1): 42-66. 1940.—The *A. salina* population living in the salt marsh of Portorose Pirano Sicciole (Italy) shows individual variations in nuclear size of the intestinal epithelium cells. Several pure lines differing in the average nuclear size were isolated; this condition is not dependent on different levels of polyploidy. The author suggests that such a genetic condition, which may be controlled by genic or cytoplasmic factors, detns. the amt. and quality of the nuclear sap. Such observations indicate that it is not safe to infer the degree of polyploidy from the size of nuclei in this species. No correlation between nuclear size and body size has been found.—*A. Buzzati-Traverso*.

7974. Cooper, Kenneth W. (*Princeton U., N. J.*) Detachment frequency of attached-X chromosomes in autosomal structural heterozygotes of *Drosophila melanogaster*. *Proc. Nation. Acad. Sci. U. S. A.* 32(10): 273-275. 1946.—An expt. was arranged to determine whether autosomal inversions influence the rate of detachment of XX by exchange with Y. The greatest difference in detachment rate was only 1.4 times the standard error and these results provide no



acceptable evidence for a difference in detachment rate of XX in structural homozygotes and heterozygotes. Consistent with these results are the propositions that: detachment of XX by exchange with Y is a mitotic rather than a meiotic process, or that detachment does not take place by ordinary crossing-over; segregation of XX from Y at meiosis is not dependent upon crossing-over between XX and Y.—G. W. Lasker.

7975. Husted, Ladley (U. Virginia, Charlottesville), and Paul Randolph Burch. (Virginia Polytech. Inst., Blacksburg.) The chromosomes of polygyrid snails. *Amer. Nat.* 80(793): 410-429. 1946.—18 spp. and subspp. in 3 genera of the Polygyridae have 58 as the typical chromosome number. The chromosomes of *Mesodon* (Polygyrinae) resemble more closely those of *Triodopsis* (Triodopsinae) than those of *Stenotrema* (Polygyrinae). Two species were extensively sampled. In *T. fraudulentula* the chromosome number varies. Individuals have 58, 59, 60, 61(?) or 62 (diploid) chromosomes. It is suggested that snails can tolerate recurrent duplication of chromosome elements, and that in the Pulmonata as a whole, the nearly unbroken seriation in chromosome number may be attributed to a gradual increase from 34 to 62. In *T. fraudulentula* snails with extra chromosomes show no increase in the vol. of their nuclei nor can they be distinguished morphologically from those with the chromosome number characteristic of the family in Virginia. In 2 spp. (*T. fraudulentula* and *T. tridentata*) a heteromorphic bivalent occurs in approx. 40-47% of the individuals examined. In *T. fraudulentula* the frequency of this bivalent, and also of extra chromosomes, appears to be a locality characteristic. In this sp. the occurrence or non-occurrence of the heteromorphic bivalent is correlated with a taxonomic distinction which may also be justified on morphological and ecological grounds. Subspecific categories of *T. tridentata*, which by other criteria are of questionable validity, show no striking difference in frequency of the heteromorphic bivalent.—Ladley Husted.

7976. Hygen, Georg. Über eine reversible, in Alkalischlösungen erfolgende Nucleolenverschmelzung bei *Microsterias denticulata* Bréb. *Bergens Mus. Arbok Naturvidenskabelig* 1941(1): 1-34. 1941.—The nucleus of *M. denticulata* generally contains many small, round nucleoli. If the cells are placed in a  $\text{KNO}_3$  soln., the nucleoli, after a time, begin to dissolve, and there appear finally 1-2 large, spherical nucleoli. The process is described with the aid of photographs. This important dissolution process is completely reversible and the return to the normal condition occurs step by step. The speed of dissolution depends on the conc. and the pH of the  $\text{KNO}_3$  soln. In a conc. range of 0.2-0.06 M the speed constantly diminishes with lower concs.; in a pH range of 3.8-8 an optimum is clearly recognizable at pH 5-6. Other alkali salts, in corresponding concs., can also bring about dissolution of nucleoli. The lyotropic properties of the ions determine their action. The observed reactions are discussed from the point of view of colloid chemistry.—Auth. summ.

7977. Kuhl, W. Kinematische Zellforschung. [Cinematographic cell study.] *Biol. Gen. [Vienna]* 16(1/3): 263-309. 10 fig. 1942.—A review.

7978. Lehmann, F. E., und W. Huber. Beobachtung an Tubifex über die Bildung von Doppelkeimern bei der zweiten Reifungsteilung und die Frage der Entstehung oözytärer Zwillinge. *Arch. Julius Klaus-Stift.* 19(3/4): 473-476. 3 fig. 1944.—In the maturation divisions of the *Tubifex* egg the 2d polar body is sometimes nearly as large as the egg cell and can be fertilized by a 2d sperm. Twins will thus arise which are similar on the maternal side (depending on the amt. of crossing over). Such double eggs have been described in polyclads, molluscs, and echinoderms; they have been produced in the sea-urchin by a rise of temp. during maturation. There is some evidence that they occur in mice. The authors suggest that a 3d type of twins exists in man also. This could be tested by using sex-linked characters or a relatively frequent condition such as dominant myopia.—R. R. Gates.

7979. Lettré, Hans, und Ingrid Delitzsch. (U. Göttingen, Germany.) Zur Mitosegiftwirkung einiger Stilbylamininderivate. [The mitosis poisoning action of some stilbylamine derivatives.] *Hoppe-Seyler's Zeitschr. physiol. Chem.* 281(5/6): 139-142. 1944.—It has been shown that a compound must contain the stilbylamine group ( $\alpha, \beta$ -diphenylethyl-

amine) in order to act as a mitosis poison. Since a methoxy group must also be present in the stilbylamine group in the  $\beta$ -phenyl residue, 4'-methoxystilbylamine is an active mitosis poison in a dose of 5  $\gamma$  per ml. of chicken heart fibroblasts culture. Prepn. of the compound is described.—A. B. McCoord.

7980. Marshak, A. (U. S. Publ. Health Serv., Washington, D. C.) Effect of mustard gas on mitosis and  $\text{P}^{32}$  uptake in regenerating liver. *Proc. Soc. Exptl. Biol. and Med.* 63(1): 118-120. 1946.—Mustard gas inhibits mitosis in regenerating rat liver at doses which do not produce chromosome abnormalities. Inhibition is not associated with a significant change in  $\text{P}^{32}$  uptake.—Alfred Marshak.

7981. Matthey, R. Les processus de la maturation chez *Pycnoscelus surinamensis* L. (Blattidae, Panchlorinae). *Arch. Julius Klaus-Stift.* 19(3/4): 529-532. 2 fig. 1944.—Confirms Pehani that in this parthenogenetic animal the maturation divisions are both equational, with 38 chromosomes. In the post-pachytene oocyte nucleus the conjugation of threads is interrupted—a process he calls endomeiosis—and in the 1st metaphase the chromosomes are already divided into 2 chromatids. He thus regards this 1st division as homologous with the 2d meiotic division in bisexual forms, the 2d corresponding with the first cleavage. The change from diploidy to tetraploidy in this and other thelytokous organisms, he conceives as resulting from the change of milieu, which produces physico-chemical effects on the chromosomes and at the same time induces parthenogenesis.—R. R. Gates.

7982. Mickey, George H. (Louisiana State U., Baton Rouge.) The presence of multiple strands in chromosomes of *Romalea* (Orthoptera). *Amer. Nat.* 80(793): 446-452. 1946.—The meiotic chromosomes in  $\sigma$  &  $\delta$  of *R. microptera* are visibly divided at least twice in advance of the division cycle in which the parts are separated. The quadripartite condition of the X chromosome is regularly visible at metaphase or anaphase of the first maturation division; it seldom shows in autosomes before telophase I. The visible split in chromatids of metaphase I becomes the functional split in the first post-meiotic mitosis. It is suggested that the chromosomes reduplicate not only twice but many times in advance. Thus each visible thread may be comprised of several hundred gene strings which are at the molecular level. The significance of these multiple stranded or polytene chromosomes is discussed.—G. H. Mickey.

7983. Oksala, Tarvo. (U. Helsinki, Finland.) On the formation of bivalents in some Pentatomids (Hemiptera). *Hereditas* 33(1/2): 110-118. 1947.—In the spermatocytes of *Dolycoris baccarum* and *Carpocoris purpureipennis* the chiasmata are in most cases fully terminalized in the diffuse stage and are usually changed into "distance chiasmata" through "super-terminalisation", the halves of each bivalent often lying very far from one another in the early diakinetid nucleus. The diploid number of chromosome (12 autosomes, X and Y in both spp.) is thus very often to be seen at this stage. At the end of diakinesis the homologous chromosomes finally move into close contact, and the bivalent attains its final compact form.—Tarvo Oksala.

7984. Valadares, M. Réarrangements somatiques spontanés dans les chromosomes des glandes salivaires de *Drosophila melanogaster*. [Spontaneous somatic rearrangements in the salivary gland chromosomes of *D. melanogaster*.] *Scientia Genetica [Torino]* 2(1): 92-100. 1940.—In a highly mutable stock of *D. melanogaster* somatic chromosome mutations have been observed in some cells of the salivary glands. Inversions, translocations, deficiencies and duplications have been observed, in each of the 3 largest chromosomes. The frequency of somatic rearrangements is fairly high, but no precise estimate has been made. Duplications, however, are the rarest chromosome abnormalities. The author does not interpret the high mutability as being dependent on the observed cytological abnormalities.—A. Buzzati-Traverso.

7985. Wallgren, I. [The pale granular substance of the cell.] *Nordisk Med.* 30(2): 1201-1207. 8 fig. 1946.—Wallgren reports the existence of a new kind of chromophobe granule in the cytoplasm and in the nucleus of cells of man and other mammals. In living white blood corpuscles the pale granular substance in the cytoplasm appears as floating drops of liquid. These anastomose and co-exist with another kind of droplet, the chromophil granules. The latter, which in the

polymorphonuclear leucocytes correspond to the eosinophil, neutrophil and basophil granules, are of low sp. gravity and may easily be drawn out into fine threads. They often contact each other by thread-shaped bridges but they never fuse with the pale drops. It is suggested that the pale drops may contain carbohydrate matter. The droplets appear to be numerous in places characterized by marked chemical activity, and hence may serve as a depot for chemical energy. The pale granular substance is evidently of great importance to the vital functions of the cells.—*Torsten Romanus.*

7986. White, M. J. D. (*Univ. Coll., London, Eng.*) The cytology of the Cecidomyidae (Diptera). II. The chromosome cycle and anomalous spermatogenesis of *Miastor*. *Jour. Morph.* 79(3): 323-365. 4 pl., 15 fig. 1946.—The cytology of pedogenetic reproduction and the spermatogenesis of the ♂ ♂ are dealt with. The germ-line is octoploid in both sexes (48 chromosomes); the soma is diploid in the ♀ ♀, haploid in the ♂ ♂. These differences in chromosome number arise through elimination of chromo-

somes during cleavage. Salivary gland nuclei are not polyploid, hence unsuited for detailed study. Endopolyploid nuclei are much larger in ♀ larvae and pupae than in ♂ ones. No sex-chromosomes can be detected at any stage. The 1st meiotic division in the ♂ is a unipolar one at which a haploid group of 6 chromosomes is separated from the remaining 42. The haploid group undergoes a 2nd meiotic division which is a normal mitosis. Thus, each octoploid spermatocyte produces 2 haploid sperms and a 7-ploid cell which does not contribute to sperm formation. In sexual reproduction each ♀ lays only 6-8 eggs, the ♂ ♂ each producing only  $1024 = 323$  sperms. Oogenesis and fertilization have not yet been studied. The spermatogenesis of *Miastor* is compared with that of *Sciara*, and it is concluded that, although both are highly anomalous, there is little similarity between them. That other Cecidomyidae have polyploid germ-lines, is shown by Reithberger's work on *Oligarces* and by the author's preliminary studies on *Taxomyia* and *Lestodiplosis*.—*Auth. (courtesy Wistar Bibl. Serv.).*

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 7945, 7951, 7954, 7955, 7956, 7957, 7967, 7969, 7971, 7978, 7984, 8115, 8280, 8333, 8350, 8452, 8473, 8550, 8815, 8819, 8884, 8890, 8966, 9024, 9038, 9043, 9090, 9106, 9112, 9131, 9313, 9654, 9677, 9680, 9779, 9794, 9872, 9874, 9969, 9972, 9993, 10009, 10012, 10016, 10017, 10019, 10026, 10027, 10048, 10123, 10166, 10266, 10268, 10269, 10550, 10556, 10557, 10611, 10758, 10774, 10813)

### GENERAL

7987. Haldane, J. B. S. The interaction of nature and nurture. *Ann. Eugenics Lond.* 13(3): 197-205. 1946.—A simple classification of the possible types of interaction between 2 stocks and 2 environments is given. This classification is applied to a number of concrete cases arising in genetics, agriculture and eugenics.—*J. B. S. Haldane.*

7988. Hogben, Lancelot. An introduction to mathematical genetics. [With a foreword by the author.] W. W. Norton Co.: N. Y., 1946. Pr. \$5.—The scope is indicated by the chapter titles: (1) Gene frequencies, genotypic frequencies and systems of mating; (2) Basic types of algebraic series in genetical theory; (3) First steps in the calculus of finite differences; (4) Binomial series; (5) Non-assortative mating in the absence of selection or mutation; (6) Selection; (7) Assortative mating and consanguinity; (8) Mutation pressure and isolate effects; Appendix (1) Significance tests for Mendelian ratios; Appendix (2) The estimation of linkage and determination of variance formulas for gene frequency analysis by the method of maximum likelihood.—*Sewall Wright.*

7989. Miche, F. Les formes de variations polymériques des caractères quantitatifs dans la panmixie. *Arch. Julius Klaus-Stift.* 19(3/4): 456-461.—A statistical study of panmixia.—*R. R. Gates.*

### PLANT

7990. Ausemus, E. R., et al. A summary of genetic studies in hexaploid and tetraploid wheats. (Majority report of the committee on nomenclature of genetic factors in wheat.) *Jour. Amer. Soc. Agron.* 38(12): 1082-1099. 1946.—Results of numerous genetic studies of characters in the hexaploid and tetraploid wheats are summarized in tables of genetic factors and linkages or associations. A uniform type of nomenclature and symbols, similar to those used in assigning symbols by the corn geneticists as summarized by Emerson et al. and in barley by Robertson et al. was used as the recommended basis in order to have a standardized system of genetic nomenclature and symbols for the wheat plant. There are 236 references included.—*E. R. Ausemus.*

7991. Bonner, David. (*Stanford U., Calif.*) Production of biochemical mutations in *Penicillium*. *Amer. Jour. Bot.* 33(10): 788-791. 1946.—Following u.-v. radiation or irradiation with x-rays, 398 strains of *P. notatum-chrysogenum* with altered nutritional requirements were isolated from a total of 85,595 strains tested. Following irradiation spores were plated out on a medium containing as many growth factors as possible. After germination of the spores, peripheral sectors were taken from each colony and transferred to agar slants of complete medium. Peripheral sectors were taken to increase the probability of genetic homogeneity.

Detection of biochemical mutations and the determination of individual requirements was similar to the methods employed by Beadle and Tatum (*Amer. Jour. Bot.* 32: 678. 1945) for isolation of biochemical mutants of *Neurospora crassa*. Each of the 398 strains differed from the parent strain by having one additional nutritional requirement. These individual requirements include the vitamins, biotin, choline, inositol, nicotinic acid, *p*-amino-benzoic acid, pyridoxin, thiamin, and the amino acids, arginine, proline, cystine, methionine, histidine, isoleucine, leucine, lysine, phenylalanine, and tryptophane. Mutations involved in the synthesis of purines and pyrimidines as well as in the reduction of nitrate were also observed. As *P. notatum-chrysogenum* is an imperfect fungus, no genetic data were obtained. Heterocaryon formation was not observed. Biochemical studies of certain strains suggest that these mutant types represent genetic modification and that in *P. notatum-chrysogenum* there is a genetic control of biochemical reactions. The biochemical relationship between arginine, proline and glutamic acid is indicated.—*David Bonner.*

7992. Breshkov, T. Prinos kiem vieprosa za plodovitostta na avtotetraploidnite i allotetraploidnite rastenii. [The fertility of autopolyploid and allopolyploid plants. *Spisanie Zemedelskiete Opitni Instituti (Zeitschr. Landw. Versuchsta. Bulgarien)* 12(3/4): 92-98. 1942.—The author studied the fertility of some autopolyploid and some allopolyploid *Nicotiana* plants obtained by Kostoff. Abortive pollen and seed set per capsule were studied. The data obtained coincide with those found by Kostoff. Allopolyploids between American and Australian spp. have larger percentage of abortive pollen than those between American spp. and set less seed per capsule (if any). Autopolyploids produced from species with larger chromosome numbers form larger percentage of abortive pollen and set less seed.—*Donitcho Kostoff.*

7993. Daskaloff, Ch. Rezultati pri podobrenie na domatite chrez kriestosvane s divata forma *Sol. racemigerum*. [Results obtained in hybridizing the cultivated tomato with a wild form, *Solanum racemigerum*.] *Spisanie Zemedelskiete Opitni Instituti (Zeitschr. Landw. Versuchsta. Bulgarien)* 13(3/4): 133-142. 1943.—From the hybrids of *S. racemigerum* with the cultivated tomato vars., Zarya and Plovdiver, the author has selected in the subsequent generations forms earlier than the cultivated vars., but lower in yield. These vars. possess larger dry substance content (ca. 1.5-2% larger than in the cultivated var. Plovdiver).—*Donitcho Kostoff.*

7994. Gescher, N. V. Protection of new products discovered by plant breeders. *Internation. Rev. Agric.* 37(1/2): T 1-10. 1946.—An historical account is given. The idea of a patent could be applied to plants reproducing asexually and to certain hybrids such as corn, but is otherwise unsuitable. The international association of professional plant

breeders for the protection of plant discoveries ('Assinse!') recommended that the Trade Mark Law be accepted internationally as a means of protecting plant breeders' products.—R. O. Earl.

7995. Håkansson, A. Contributions to a cytological analysis of the species differences of *Godetia amoena* and *G. whitneyi*. *Hereditas* 33(1/2): 235-260. 1947.—The investigated material is from the cultures of Dr. Gunnar Hiorth, Vollebakk, Norway. Hiorth has tried to transfer the petal spot  $F^b$  from *G. amoena* to *G. whitneyi*, backcrossing hybrid  $F^b$  plants to *G. whitneyi* through successive generations.  $F^b$  plants in different generations are very sterile and their meiosis shows the presence of *amoena* chromosomes. In  $F_4$  appeared the heterotrimeric  $F^b$  type, with the pairing 6 II + heterochain-of-3. This type has 2 *amoena* chromosomes, i.e., the end-chromosomes of the heterochain. The larger end-chromosome, that is, the  $F^b$  chromosome must, however, be supplemented by the smaller end-chromosome to give a fertile gene. Still more sterile is a disomic  $F^b$  type that has the heterochain and a 2d configuration-of-3. In  $F_5$  appeared for the first time the fertile  $F^b$  type having 7 II. Here, the gene  $F^b$  must, through crossing-over, have been transferred to the *whitneyi* chromosome in the center of the heterochain. The small end-chromosome may show changed size, probably owing to exchanges in the heterochain. Other structural changes in the cross are a new inversion and a reciprocal interchange involving the larger end-chromosome (the  $F^b$  chromosome). Also the *amoena* chromosome having the gene  $C^{sp}$  is structurally different and causes sterility in crosses with *whitneyi*. Other spontaneous chromosome changes described are: the rather frequent loss of the foreign segment from a *whitneyi* chromosome carrying a segment of *G. deflexa*; a fragmented chromosome in *whitneyi* having the gene  $C^{su}$ , this fragment chromosome is often eliminated at mitosis; and the fragmentation of the *whitneyi* chromosome carrying  $Kl$ .—Arthur Håkansson.

7996. Hansen, H. N., and W. C. Snyder. (U. California, Berkeley.) Inheritance of sex in fungi. *Proc. Nation. Acad. U. S. A.* 32(10): 272-273. 1946.—The fungus *Hypomyces solani* f. *curcurbitae* is normally hermaphroditic, but when it mutates to  $\sigma$  or  $\rho$  the progeny of the crosses with the normal hermaphrodite occur in the ratio of 1:1 indicating that the factors for  $\sigma$  and  $\rho$  are alleles of the factor for hermaphrodite. However, when 200 single-ascospore thalli from the cross  $\sigma \times \rho$  were tested, 4 sex types appeared: 84  $\sigma \sigma$ , 64  $\rho \rho$ , 24 hermaphrodites and 28 neuters. The factors for  $\sigma \times \rho$  are thus not alleles but occupy loci some distance apart in homologous chromosomes. Crossing over between the loci occurs and is responsible for the appearance of hermaphrodites and neuters in the  $\sigma \times \rho$  cross.—G. W. Lasker.

7997. Kostoff, D. Poliploidii i rastitelno proizvodstvo. [Polyploidy and plant production.] *Spisanie Zemedelskii Opilni Instituti (Zeitschr. Landw. Versuchsta. Bulgarien)* 13(1/2): 71-93. 1943.—Considering the polyploidy of the 30 most important cultivated plants in respect to their production of proteins, carbohydrates (including sugar), oil, fibers, etc., in the whole world, it is shown how much carbohydrates, oils and proteins are produced from diploids and how much from polyploid cultivated plants. Polyploid wheats, for example, yield annually ca. 21 million tons of proteins, 122 million tons of carbohydrates and 4 million tons of oil. Such an analysis is carried out for the most important plants. Another list is given of 109 plants with their chromosome numbers that are of significance for agriculture and silviculture, pointing out the frequency of polyploidy. Polyploid plants recently produced or newly introduced into agriculture, that may play an important role from the standpoint of agric. economics, are broadly considered. Four tetraploid plants produced by the author are evaluated from an agric. point of view (*Taraxacum kok-saghyz*, *Panicum miliaceum*, *Sorghum saccharatum*, and *Atropa belladonna*). *T. kok-saghyz* tetraploids have larger seed, better growth, the root wt. being  $4n/2n = 1.2$  up to 1.4, and the rubber content  $4n/2n = 1.18$ . Diploid plants have from 3159 to 2799 seeds per gm., while 1475 tetraploid seeds weigh 1 gm., these being about twice as large. 1000 seeds of tetraploid *Panicum miliaceum* weigh from 8.5 to 9.5 gms., while 1000 seeds of diploid *P. m.* weigh only 0.5 to 6.1 gms., from full-grown plants. From plants grown in the greenhouse the wts. are:

4.5 gms. for 1000 seeds of the diploid and 7.5-9.5 gms. for the tetraploid forms. Diploid *Sorghum saccharatum* in immature condition gives 22.36% dry substance and 6.42% sugar; the tetraploid form contains at the same time, grown under the same conditions, 23.4% dry substance and 9.59% sugar, the latter increasing to 11.64%. The tetraploid form of *Atropa belladonna* has significantly larger seeds and 0.58% alkaloids, while the diploid form has 0.49% alkaloids (chiefly atropin). The limited role of polyploidy in evolution is discussed.—Doncho Kostoff.

7998. Kostoff, D., A. Gorbacheva, i P. Dimitroff. Izmenenie na goleminata na kletkite pri avto- i allopoliploidniti tiutiumi. [Changes in the size of the cells in auto- and in allopolyploid tobaccos.] *Spisanie Zemedelskii Opilni Instituti (Zeitschr. Landw. Versuchsta. Bulgarien)* 13(1/2): 3-12. 1943.—The size of the pollen of 8 allopolyploid *Nicotiana* species hybrids and one varietal hybrid, as well as autotetraploids from 7 *Nicotiana* spp., was compared with that of their original diploid forms. The volumes of the pollen and the coeffs. of cell-volume enlargement ( $4n$  volume/ $2n$  volume) due to tetraploidy were calculated. The  $4n/2n$  volume ratio for the autopolyploids is: for *N. longiflora* 1.301, for *S. sanderae* 1.398, for *N. glauca* 1.254, for *N. suaveolens* 1.261, for *N. rustica* 1.479, for *N. tabacum* var. *macrophylla* 1.327, for the cigarette tobacco *N. tabacum* (DA) 1.339. The same coeff. for the allotetraploids were: for *N. longiflora*  $\times$  *Sanderae* 1.267, *N. suaveolens*  $\times$  *longiflora* 1.267, *N. suaveolens*  $\times$  *glauca* 1.34, *N. rustica*  $\times$  *glauca* 1.229, *N. rustica*  $\times$  *tabacum* 1.31 and for the varietal allotetraploid *N. suaveolens* 1.244. These numbers, correlated with the cell size in  $F_1$  hybrids (Kostoff and Arutunova, 1935), throw some light on certain evolutionary problems, especially when one considers the significantly decreased size of the pollen grains in the allotetraploid *N. silvestris*  $\times$  *tomentosiformis*, when the latter is inbred for several generations.—Doncho Kostoff.

7999. Love, R. Merton. (Agric. Expt. Sta., Davis, Calif.) Interspecific and intergeneric hybridization in forage crop improvement. *Jour. Amer. Soc. Agron.* 39(1): 41-46. 1947.—From examples of facts elucidated by studies of meiotic pairing in *Stipa* hybrids and the elimination of chromosomes as evidenced by micronuclei in pollen quartets of polyploids that behave cytogenetically as diploids (e.g., *Triticum aestivum*), the writer points out the value of cytogenetic studies in a hybridization program. Wide crosses are important because of one or more of 3 potentials: hybrid vigor in sterile hybrids, amphidiploids, and segregation products. Sterile hybrids between *Stipa* spp. occur naturally but compatible parents must be selected. Depending on the nature of the amphidiploids they may be used in 3 ways: nonsegregating amphidiploids may be an end in themselves, but many parent strains may have to be tested before the desired amphidiploid is obtained; hybridization of related nonsegregating amphidiploids may be necessary in order to ensure transfer of certain desirable gene blocks; selection among progeny of amphidiploids that do not breed true must be an integral part of the program. Naturally occurring fertile derivatives (e.g., in *Triticum*  $\times$  *Agropyron*) add to the opportunity for selection among fortuitous gene combinations. It was emphasized that most of the work involving wide crosses has been done from the cytogenetic standpoint. Its possibilities in forage improvement warrant the development of a well-organized program wherein the plant breeder thinks and plans in terms of selected strains rather than in terms of unselected species.—R. M. Love.

8000. Lucas, George Blanchard. (Louisiana State U., Baton Rouge.) Genetics of *Glomerella*. IV. Nuclear phenomena in the ascus. *Amer. Jour. Bot.* 33(10): 802-806. 5 fig. 1946.—Perithecia from individual strains of *Glomerella* and also from crosses between strains were obtained in pure cultures and the development of the asci studied. In the young ascus, there was apparently a fusion of 2 haploid nuclei followed by the three divisions which were intranuclear. The haploid number of chromosomes appeared to be 4. The chromosomes were extremely small, the longest about  $4\mu$  in the first division, but  $< 1\mu$  in the 3d. The fusion nucleolus was large. Following the 1st division, a nucleolus was not definitely visible until it again reappeared in the nucleus of the ascospore.—C. W. Edgerton.

8001. Murray, Calvin Clyde. Inheritance of length of fiber in American upland cotton. *Cornell Univ. Abstracts of*



from 64 D<sub>1</sub>-65 D<sub>5</sub> (5% of 3L). It includes 55 bands of the salivary chromosomes and the loci *ju*, *dv* and *Me*'. It reduces crossing over within 3L by 10.7 units (21% of the total in 3L). It is lethal when homozygous and in 2 doses in triploids, produces a dominant effect in heterozygous diploids but no effect in one dose in triploids or hyperploids. It is suggested that this pattern in general indicates a deficiency covering one (or more) haplo-insufficient normal genes. Interaction effects are found with several genes including certain maternal effects. Thus *Vn-dv* is lethal from *dv/dv* ♀♀ but not otherwise. Again *Vn-dv* ♀♀, heterozygous for *h* and backcrossed to hairy ♂♂, give very few and very abnormal hairy offspring, which is not true of the reciprocal.—*Sewall Wright*.

8025. Moree, Ray. (Washington State Coll., Pullman.) Genic sterility in interspecific male hybrids of *Peromyscus*. *Anat. Rec.* 96(4): 66. 1946.—An abstract.

8026. Owen, R. D., H. P. Davis, and R. F. Morgan. (U. Wisconsin, Madison.) Quintuplet calves and erythrocyte mosaicism. *Jour. Heredity* 37(10): 291-297. 4 fig. 1946.—Descriptive data on a set of living bovine quintuplets, 1 modified heifer and 4 bulls, suggest that the animals developed from 5 different fertilized eggs. Their bloods, however, gave identical results when tested for inherited cellular antigens. This result is consistent with the conclusions (1) that placental anastomoses had given all 5 embryos a common circulation; (2) that wholesale exchange and intermixture of circulating cells among the embryos was therefore effected; and (3) that the exchanged cells became established in the hematopoietic tissues of the 5 animals, so that the circulating erythrocytes, the cellular descendants of these exchanged elements, now represent a genetic mosaic. This mosaicism was directly demonstrated by hemolytic fractionation of erythrocyte suspensions from the quintuplets, and cell-counts after such fractionation indicated that the mosaic tissue was quantitatively similar in all five animals. This is taken to indicate that most or all bovine erythrocytes have their origin in cells circulating in the embryo.—*R. D. Owen*.

8027. Poulson, D. F., and E. J. Boell. (Yale U., New Haven, Conn.) The development of cholinesterase activity in embryos of normal and genetically deficient strains of *Drosophila melanogaster*. *Anat. Rec.* 96(1) 12. 1946.—An abstract.

8028. Sawin, Paul B. (Brown U., Providence, R. I.) Morphogenetic studies of the rabbit. III. Skeletal variations resulting from the interaction of gene determined growth forces. *Anat. Rec.* 96(2): 183-200. 1 fig. 1946.—Study of the number and position of the ventral spinous processes occurring on vertebrae adjacent to the thoraco-lumbar border in 3 inbred races of rabbits and in hybrid generations derived from crossing them shows that (as has been found previously in the case of extra ribs and presacral vertebrae) these variations are detd. by growth processes having an influence over a much broader area than a single vertebra. The position of these processes and their inheritance corresponds very closely if not identically with that of the lumbar region in general, the F<sub>1</sub> and subsequent generations being intermediate between those of the parents involved. The variation in magnitude of the region (ventral spinous process) from race to race and generation to generation, however, is not correlated with the variation in magnitude of the lumbar region but there is a direct association with the relative anteroposterior position of these processes. Their greatest development occurs in those races or generations in which their position is on the more central vertebrae. This observation combined with previous knowledge of growth processes in these races leads to the conclusion that maximum development of these spinous processes occurs as the result of the overlapping or combined influence of gene induced accelerations in the thoracic region with those in the lumbar region.—*Auth.*, (courtesy *Wistar Bibl. Serv.*).

8029. Schaeffer, A. A. (Temple U., Philadelphia, Pa.) X-ray mutations in the giant multinuclear ameba *Chaos chaos* Linn. *Anat. Rec.* 96(4): 35. 1946.—An abstract.

8030. Schultz, Jack, Patricia St. Lawrence, and Dorothy Newmeyer. (Lankenau Hosp., Philadelphia, Pa.) A chemically defined medium for the growth of *Drosophila melanogaster*. *Anat. Rec.* 96(4): 44. 1946.—An abstract.

8031. Villee, Claude A. (Harvard U., Cambridge, Mass.),

and George I. Lavin. (Rockefeller Inst. Med. Res., N. Y. C.) The production of phenocopies in *Drosophila* using visible light and a photodynamic dye. *Anat. Rec.* 96(4): 69-70. 1946.—An abstract.

8032. Whiting, Anna R. (U. Pennsylvania, Philadelphia.) Androgenetic males from eggs x-rayed with dose many times lethal. *Anat. Rec.* 96(4): 11-12. 1946.—An abstract.

8033. Whiting, P. W. (U. Pennsylvania, Philadelphia.) A strongly intersexual female in *Habrobracon*. *Biol. Bull.* 91(3): 243-246. 1 fig. 1946.—This specimen, more strongly intersexual than a group previously reported, lacks gonads and has defective poison apparatus. It is the 3d type of *Habrobracon* intersex reported. X-radiation may have modified a sex-allele resulting in an intersexual heterozygote rather than a normal ♂.—*P. W. Whiting*.

8034. Whiting, P. W., and Mary B. LeFevre. (U. Pennsylvania, Philadelphia.) Phenotypic similarity in ocellar size of haploid males with different sex alleles in *Habrobracon*. *Anat. Rec.* 96(4): 82. 1946.—An abstract.

#### MAN

8035. Cole, H. N., Horace K. Giffen, J. T. Simmons, and George M. Stroud, III. (Western Reserve U., Cleveland, Ohio.) Congenital cataracts in sisters with congenital ectodermal dysplasia. *Jour. Amer. Med. Assoc.* 129(11): 723-727. 3 fig. 1945.—Ectodermal dysplasia is a rare disease marked by smooth, glossy skin, absence of hair and sweat glands, defective teeth, saddle nose and mental impairment. It is often hereditary. The literature of cases is discussed (22 refs.). The cases of 2 sisters, 10 and 22 mos. old, are presented. There was involvement of all ectodermal elements. Photographs of the children are shown.

8036. Grieve, J., and G. M. Morant. Records of eye colour for British populations and a description of a new eye-colour scale. *Ann. Eugenics* 13(3): 161-171. 1946.—Two independent observers matching the eyes of the same series of people with the 16 glass eyes of Martin's scale can only be expected to show agreement in about 40% of cases. Comparison of such records with frequencies found for verbally defined categories shows that different methods may give widely divergent impressions of the distribution of eye colors in a population. New records for 517 people fail to reveal any statistically significant differences between different British populations, and, in particular, there is no suggestion of a distinction between those of eastern and western England. Far larger samples would probably be required to establish regional differences. The prepn. of a new eye-color scale made in plastics is described. This was based on Martin's scale, so that records obtained by using the 2 will be comparable, with modifications in the grading of the 'eyes' and in the way they are arranged.—*Authors*.

8037. Hanhart, E. Zur Erbbiologie der hämorrhagischen Diathesen. *Arch. Julius Klaus-Stift.* 19(3/4): 543-549. 1944.—A short summary of the biology of haemophilia and other hemorrhagic diseases, including a fibrinogenemia (lack of thrombokinase), fibrinopenia, thrombasthenia and telangiectasis. Cases of hemophilic ♀♀ are cited and a summary table of hereditary hemorrhagic diatheses is given.—*R. R. Gates*.

8038. Hanhart, E. Neue familiäre Fälle von Mongoloiden Schwachsinn als Beweis für die Mitwirkung von Erbfaktoren. *Arch. Julius Klaus-Stift.* 19(3/4): 549-550. 1944.—A survey of Mongoloid idiocy in Switzerland found 285 cases in 105 family pedigrees. Author concludes it is an irregular dominant in heredity and may possibly be exogenously produced in certain cases. The age of the mothers of Mongoloids is high—35.5 years—but they may later have normal children. Mongoloids frequently have off-standing ears and a special form of lingua plicata, as well as the simian crease and generally clinodactyly. The parents and relatives frequently have poly-, syn-, brachy- and camptodactyly. Three typical Mong. idiots were children of three sibs. Ordinary feeble-minded are also frequent in these pedigrees. The frequency of Mongoloids is 6000 in all Switzerland, but definitely higher in the inner mountains.—*R. R. Gates*.

8039. Harris, H. The inheritance of premature baldness in men. *Ann. Eugenics* 13(3): 172-181. 1946.—The hypothesis that premature baldness is inherited discretely and distinctly from late baldness, and as a simple Mendelian dominant, fits the observations made. The hypotheses of simple

recessiveness and sex-linked dominance or recessiveness do not fit. The hypothesis that both late and premature baldness are determined by the same gene do not fit.—*H. Harris.*

8040. Janssen, Tieline A. E., and Cornelia de Lange. Familial congenital hypertrichosis totalis (Trichostasis). *Acta Paediatrica [Uppsala]* 33(1): 69-78. 1945.—A brief review of hypertrichosis lanuginosa, i.e., the persistence and excessive development of the lanugo of the fetus (a better name is trichostasis). A detailed case history, with sudden death and post mortem investigation is reported; a striking fact was the small size of the adrenals. The case supports Ecker's hypothesis which explains the congenital hairiness as an arrested development of the haircoat.—*Ib Boesen.*

8041. Johnson, Sture A. M., and Avery R. Test. (*U. Michigan, Ann Arbor.*) Epidermolysis bullosa simplex of the hands and feet. A genetic study of the hereditary type. *Arch. Derm. and Syph.* 53(6): 610-619. 2 fig. 1946.—The literature on epidermolysis bullosa simplex is reviewed, showing that other cases of hereditary blistering restricted to the hands and feet have been reported. It is suggested that this restricted type probably forms a genetic entity, and perhaps should be called Elliot's localized epidermolysis bullosa, as Elliot was the first to describe this type. Causes and conditions for easy blistering in the propositus and other members of his family are described. Bullae examined on the patient were tense, numerous, occurring only on plantar surfaces of feet, palmar surfaces of hands. Normal hair, nails, teeth, urine, together with lack of permanent scarring, characterize this family. A pedigree of 105 persons related to the propositus is shown, with indication of which were examined, which known only by report. The same is done for an additional pedigree of 356 persons, also related. Various details are discussed. These 2 pedigrees indicate that in this kindred the defect is a dominant trait, of full penetrance and stability. There is no statistical evidence of a preponderance of either sex among the parents of affected persons, nor is there any significant deviation from the expected 1:1 sex ratio of ordinary Mendelian dominant inheritance.—*A. R. Test.*

8042. Kallmann, F. J., and J. S. Mickey. (*New York State Psychiat. Inst. and Hosp., N. Y. C.*) Genetic concepts and folie à deux. *Jour. Heredity* 37(10): 298-305. 4 fig. 1946.—According to the original definition given by Lasègue and Falret, the concept of induced insanity or folie à deux (insanity of two) referred to the transference of delusional ideas from a psychotic individual to intimate associates who had been under his domineering influence for a long time. More recently, the term has been used rather loosely to describe the coexistence of any mental disorders of a similar variety in 2 or more persons who were deemed closely enough associated; for instance, in entire sibships or in twin partners who did not even live together. In this nebulous manner, folie à deux has been stretched into a convenient cover for investigators opposed to the principle of human heredity in any form. Several family histories are presented by the authors to illustrate that there is no consistent relationship between the social disintegration of a particular family background and the number or type of psychotic phenomena developed by the different members of such family units. In regard to schizophrenia it is shown conclusively in a sample of 691 schizophrenic twin index families, that the chance of developing such a psychosis in comparable environments increases in direct proportion to the degree of blood relationship to a schizophrenic index case. A slight increase in the schizophrenia rate for marriage partners of schizophrenic index cases is referable to the effect of mate selection rather than to "psychotic contagion." The authors conclude that the time-honored concept of folie à deux has become a rather meaningless colloquialism, which may be useful for the practice of counting in French, but not for describing the occurrence of similar schizophrenic symptoms in twin pairs or other units of blood relatives. They suggest that the application of the term "induced insanity" be limited to transference of delusional ideas in marriage partners and intimate friends living together. The use of the term in units of blood relatives is considered inadvisable, if the primary significance of the factor of blood relationship—heredity—cannot be safely excluded.—*F. J. Kallmann.*

8043. Kelly, Ch. H., and J. W. Lawlah. Albers-Schönberg disease. A family survey. *Radiology* 47(5): 507-513. 9 fig. 1946.—Report of 4 cases of Albers-Schönberg

disease occurring in the 3d generation of a family. A radiographic survey was made of all members of the 2d generation and the maternal half of the 1st generation. No disease was discovered among these members of the family.—*F. P. Ellinger.*

8044. Lasker, G. W. (*Duke U., Durham, N. C.*) The inheritance of cleidocranial dysostosis. *Human Biol.* 18(2): 103-126. 1946.—Cleidocranial dysostosis, a rare developmental disease, is now known from 505 cases plus 30 doubtful ones. The disease primarily affects membrane bones, the most prominent clinical sign being an absence or defect of the clavicles. Affected individuals ordinarily show little if any disability and have normal life expectancy. The disease seems to occur in all races and the frequency of familial cases suggests the involvement of autosomal dominant inheritance. The genetical evidence supporting this belief is discussed. 72 genealogical charts, taken from the literature, and an extensive bibliography are included.—*F. G. Evans.*

8045. Lee, C. D., and L. S. Penrose. A contribution to the genetics of hair colour in man. *Ann. Eugenics* 13(3): 182-183. 1946.—Following the technique of Arnow the writers have confirmed that pigment could be obtained by this method from red hair, but they also obtained apparently identical pigment from all types of hair. The conc. of this pigment seems to be genetically determined.—*Authors.*

8046. Lüscher, E. Otomikroskopische Beobachtung an Zwillingsstrommelfellen. *Arch. Julius Klaus-Stift.* 19(3/4): 461-462. 1944.—Nine pairs of monozygotic and 9 pairs of dizygotic twins were studied with the ear-microscope, the eardrums of the latter, magnified 10-20 times, showed a series of types with numerous differences for the study of heredity. These belong partly to the epithelium but more to the mesenchyme. Eardrums are thus as characteristic as fingerprints. In biocular twins they are of similar type but in uniovular they also agree in details. Study of 13 characteristics of the eardrum shows that they are determined by heredity and little altered by injuries in childhood. Degenerative changes of the eardrum are inherited but can also result from damage.—*R. R. Gates.*

8047. Morel, F. Recherches généalogiques sur un cas d'Oligophrenie phenylpyruvique. *Arch. Julius Klaus-Stift.* 19(3/4): 477-481. 2 fig. 1944.—Describes the third Swiss case of phenylpyruvic oligophrenia in a girl of 17 with mental age 8 yrs. The parents were normal and the ancestors, back to the 16 great-great-grandparents, were unrelated. Certain ancestors were traced back 9 generations to 1660, without finding any consanguinity, although some surnames were similar. The family of the maternal grandmother showed an accumulation of nervous conditions, but a fire destroyed the village records in 1806, so the presumed consanguinity could not be determined.—*R. R. Gates.*

8048. Morsier, G. de. Psychose hallucinatoire identique chez deux jumelles univitellines. *Arch. Julius Klaus-Stift.* 19(3/4): 468-472. 5 fig. 1944.—Identical ♀ twins were born in 1863, separated at 15. At 51 one began to hear voices, the other 16 months later. They lived to over 70, both probably schizophrenic but one catatonic, the other paranoid. In both, the frontal sinus was practically absent, the sphenoid sinus much developed.—*R. R. Gates.*

8049. Morsier, G. de, et A. Rey. Modifications du phénotype par un traumatisme cérébral chez une jumelle univitelline. *Arch. Julius Klaus-Stift.* 19(3/4): 463-468. 4 fig. 1944.—A pair of celibate ♀ twins 35 yrs. old were identical. They made the same mistakes in school, had the same ideas, tastes and interests, had the same dental defects and slight facial asymmetry. Both had in the right leg a varicose vein of exactly the same form. One had astigmatism in the left eye, the other in the right, but the retinal arteries were unlike. When 31, one suffered brain trauma from a fall. The results are detailed. Both remained equal in intelligence, but the memory and attention were affected by the accident and a goiter of Hashimoto or thyroidose lymphadenoma developed, which was only partly relieved by operation.—*R. R. Gates.*

8050. Pierret, Yvan. Les érythroblastoses familiales à propos d'un cas d'œdème foeto-placentaire. *Acta Clin. Belgica* 1(4): 349-360. 2 fig. 1946.—Pierret classifies the different forms of erythroblastosis as seen: (1) in the fetus (2 types), (2) in the newborn (2 types), (3) in the young

infant (3 types), (4) in the child 2-8 yrs., (5) in the adult, (6) a miscellaneous group. He discusses briefly each type included in his classification. He presents a case under his own personal observation, describing the pathologic anatomy, blood and serum exam. and factors relative to the case. A premature, syphilitic infant, which lived only a short time, had symptoms due to fetal and placental edema. The erythroblastosis could not be ascribed to the Rh factor, or to A and B antigens since both mother and infant were Rh negative and of the same blood-group, O.

8051. Silva, Ernani Martins da. (*Inst. Oswaldo Cruz, Rio de Janeiro, Brazil.*) Estudos sobre índice de sickleia. [Studies on sickleia.] *Mem. Inst. Oswaldo Cruz* 42(2): 315-340. 10 fig. 1945.—In a survey of a heterogeneous group of 1130 negroids and cross-breeds it was found that 0.4% of the negroids, 8% of the negroid-caucasoid crosses and 9% of negroid-caucasoid-mongoloid crosses were sickleemic. 30 mongoloid and 120 caucasoid individuals were examined with negative results. In 58 sickleemic individuals, carriers of morbid conditions producing circulatory stasis, no anatomicopathological changes of sickle cell-anemia were observed, contrary to the hypothesis that stasis is sufficient for the transition from a sickleemic to an anemic condition. In 8 cases of infection with *Plasmodium falciparum*, 2 cases with *P. falciparum* and *P. vivax* and 3 cases with *P. vivax* in sickleemic individuals no symptoms of sickle-cell anemia were observed. It was verified that parasitism by *P. vivax* does not check sicklization. Failure to consider ethnic and hereditary factors in formulating an index of sickleia is criticized. Recommendations are made for the identification of sickleemic individuals.—*M. A. Stewart.*

8052. Snyder, L. H. (*Ohio State U., Columbus.*) The twenty-first Hermann Biggs Memorial Lecture: Medical genetics and public health. *Bull. New York Acad. Med.* 22: 566-587. 1946.—The applications of medical genetics to public health are discussed, with illustrations in the areas of preventive medicine, diagnosis, genetic prognosis, and medical and medico-legal applications of the blood groups and types.—*L. H. Snyder.*

8053. Snyder, L. H. (*Ohio State U., Columbus.*) The Rh factor in feeble-mindedness and other diseases. *Minnesota Med.* 29: 121-129. 1946.—Examples are presented of the practical applications of genetics to medicine in prognosis and prevention. The inheritance of the various human blood

agglutinogens is reviewed, with especial reference to the Rh and Hr factors. The evidence for Rh immunization as a cause of mental deficiency is reviewed.—*L. H. Snyder.*

8054. Snyder, L. H., and C. A. Doan. (*Ohio State U., Columbus.*) Studies in human inheritance. XXV. Is the homozygous form of multiple telangiectasia lethal? *Jour. Lab. and Clin. Med.* 29(12): 1211-1216. 1944.—A case is presented of rapidly developing, severe, generalized, multiple telangiectasia in a newborn female infant. The condition, beginning in utero, was incompatible with life, death occurring at 11 weeks of age. Classical telangiectatic hemangiomas occurred in the paternal grandmother, the maternal grandfather, and both parents. The family history suggests the probability that this case represents the first recorded instance of the homozygous form of the dyscrasia and that the gene for multiple telangiectasia is lethal when homozygous.—*L. H. Snyder.*

8055. Steck, H. Les dispositions légales concernant la stérilisation eugénique dans le Canton de Vaud et leur application. *Arch. Julius Klaus-Stift.* 19(3/4): 481-485. 1944.—The first sterilization law in Europe was passed in the canton Vaud in 1928, permitting mental defectives to be sterilized under certain conditions. In the following 15 years 111 cases were treated (9 ♂, 102 ♀), mainly oligophrenics. In the same period 11 men were castrated. Marriage of certain psychopaths and feeble-minded is permitted on condition of previous sterilization.—*R. R. Gates.*

8056. Töndury, G. Missbildung und Vererbung. *Arch. Julius Klaus-Stift.* 19(3/4): 492-509. 4 fig. 1944.—A general discussion with examples of the developmental physiology and genetic basis of some typical malformations in man. It is often impossible to say whether a particular case arises from inheritance or not, but all miscarriages should be studied to determine the early stages of development of abnormalities. The familial occurrence of cyclopia and arrhinencephaly is recorded. Multiple defects are sometimes due to pleiotropic effects of one gene. Defects may begin as early as cleavage, gastrulation, neurulation or later, and phenocopies may result from external factors at the critical phases. Defects are more frequent in male babies, partly because many are sex-linked and partly because the male sex is constitutionally weaker. Such defects as spina bifida, atresia ani and sirenoïd malformations are discussed on the basis of animal expt.—*R. R. Gates.*

## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also B. A. 21(3): Entries 4988, 5370, 5400, 5401, 5416, 5435, 5436, 5438, 5441, 5446, 5459, 5468, 5625, 5662, 5698, 5701, 5851, 6091, 6925, 6928, 6934, 7031, 7186; and in this issue 7988, 7989, 8103, 8104, 8229, 8237, 8290, 8299, 8340, 8341, 8408, 8409, 8418, 8444, 8474, 8539, 8576, 8606, 8624, 8632, 8639, 8665, 8675, 8747, 8781, 8842, 8856, 8905, 9061, 9315, 9759, 9847, 9848, 10209, 10332, 10595)

8057. Finney, D. J. Orthogonal partitions of the  $6 \times 6$  Latin squares. *Ann. Eugenics* 13(3): 184-196. 1946.—In an earlier paper, the possibility of finding partitions of the 36 cells of a  $6 \times 6$  Latin square which should be orthogonal with rows, columns and letters was examined. No (1<sup>st</sup>) partitions exist, but, for 4 of the 12 adjugate sets, the other 9 partitions of the number 6 can be achieved. The present paper discusses the directrices, of which every square has 0, 8, 24, or 32, and derives full or partial enumerations of many types of partition from consideration of the relationships among them. Two adjugate sets are very rich in partitions, one set showing a high degree of symmetry; the others are poorer in the enumerated types, but quantitative statements cannot yet be made about (1,2,3), (2<sup>3</sup>), (2,4) or (3<sup>3</sup>) partitions. For some adjugate sets, mutually orthogonal partitions have been found. Mutually orthogonal pairs of (1<sup>3</sup>, 3) and (1<sup>2</sup>, 4) partitions have been enumerated, as also have groups of 3 and 4 mutually orthogonal directrices, which exist only in one adjugate set. Properties of this kind for other types of partition have not been investigated.—*D. J. Finney.*

8058. Hartley, H. O. Note on the calculations of the distribution of the estimate of mean deviation in normal samples. *Biometrika* 33(3): 257-265. 1945.—A brief account is given for determining the tables of the probability integral of the mean deviation in normal samples. This is

followed by the table for various values of  $m$  and  $n$  where  $n$  is the number in the sample and  $m$  is the mean deviation of this sample.—*W. D. Balen.*

8059. Hayes, Samuel P. Diagrams for computing tetrachoric correlation coefficients from percentage differences. *Psychometrika* 11(3): 163-172. 1946.—A description is given of diagrams (available separately) for computing tetrachoric correlation coefficients. The diagrams are entered with "per cent of combined groups above dividing point" and differences between groups in their per cents above the dividing point.—*Courtesy Psychometrika.*

8060. Hollander, W. F. (*Carnegie Inst., Cold Spring Harbor, N. Y.*) Notes on graphic biometric comparisons of samples. *Amer. Nat.* 80(793): 494-496. 1946.—Percentile analysis of a frequency distribution is represented by a line (range) with cross markings (median, quartiles, etc.). Arrangement of a series of such graphic analyses is simple and permits ready comparison.—*W. F. Hollander.*

8061. Roessler, E. B. (*U. California, Davis.*) Testing the significance of observations compared with a control. *Proc. Amer. Soc. Hort. Sci.* 47: 249-251. 1946.—In testing treatments with a control where analysis of variance procedure has not been employed the ordinary  $t$ -test is not applicable since the arrangement is not random and the comparison is between selected pairs. A table giving values of  $t' =$



largest  $\frac{\text{deviation}}{\text{standard error}}$  at the 5% and 1% levels of significance is presented for testing differences between such selected pairs. Use of the table is illustrated.—*E. B. Roessler.*

8062. Wherry, Robert J. (*U. No. Carolina, Chapel Hill*), and Erwin K. Taylor. The relation of multiserial eta to other measures of correlation. *Psychometrika* 11(3): 155-161. 1946.—Ordinary product-moment correlation and regression methods are frequently not immediately applicable to qualitative data, whereas multiserial  $r$ , point-multiserial  $r$ , and multiserial  $\eta$  can be easily applied. The multiserial  $r$  is rejected for prediction since it tells us only what the correlation might be if certain assumptions were true and if we could measure what is not now measured. The point-multiserial  $r$  and multiserial  $\eta$  are identical when the number of categories is 2, but differ when it is 3 or greater. The multiserial  $\eta$  is identical with the product-moment  $r$  when categories are assigned scale values equal to their means on the continuous variable. With 3 or more categories, the point-multiserial  $r$ , which assumes linearity with equal step intervals, is always lower than the multiserial  $\eta$ , which forces linearity by adoption of unequal step intervals based upon differences in criterion attainment. While the multiserial eta expends one degree of freedom with the weighting of each category, this is known and correctable, whereas the vague partial loss of degrees of freedom due to ordering the categories in the point-multiserial  $r$  is not correctable.—*Courtesy Psychometrika.*

8063. Woofter, T. J. Probabilities of death in closed population groups. Illustrated by probabilities of death of white fathers after birth of children. *Human Biol.* 18(3): 158-170. 1946.—This article analyzes 4 methods of calculating the successive annual probabilities of death in closed groups. Such groups are defined as composed of individuals

who acquire a status in a specified period (such as those who become fathers in a particular year) whose number is not added to after that period and who remain in the status until death. The only absolutely accurate method of calculating such probabilities is to secure the successive probability of death for each age included in the distribution and average these probabilities. However, very accurate results can be obtained by 2 methods which are much more easily calculated. The first method requires the estimate of the age of mean mortality of the group at each anniversary of the acquisition of status. The death rates corresponding to these ages, read from the appropriate life table, may be applied to a cohort of 100,000 individuals entering exposure at age  $v$  (the age of mean mortality when the status was acquired). Between 2 anniversaries a calendar year elapses, but the age of mean mortality does not advance by a full year by reason of the fact that a larger proportion of the young members of the group survive. Hence, the av. age of the group tends to approach the age of its youngest member. The method of estimating the relationship between the increase in age of mean mortality and the number of lapsed anniversaries involves the calculation of the mean annual rate of increase in the mean mortality age during the yrs. required for the youngest member  $y$  to attain the age  $\omega$  (the limiting age in the life table). It is demonstrated that the age of mean mortality does not increase uniformly by the mean increment  $k$ , but varies from  $k_0$ , the rate in the initial year, to  $k$  at the middle of the period  $\omega - y$ . Hence, a parabola is derived for the estimation of successive values of  $\Sigma k_a$  (the cumulated increase in the age of mean mortality from anniversary  $0$  to anniversary  $a$ ). The 2d short method is based on the same principle as the first, but involves calculation based on the mean survival from the date of acquisition of the status, and the probability of death is derived as the complement of the mean survival from the usual formula.—*T. J. Woofter.*

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 7960, 8263, 8270, 8271, 8272, 9488, 10156, 10202)

### MICROSCOPY AND TECHNIQUE

8064. Conn, H. J. A handbook on the nature and uses of the dyes employed in the biological laboratory. 5th ed. 346p. Biotech. Publ.: Geneva, N. Y., 1946. Pr. \$3.75.—The book has been largely rewritten. More changes have been made than in any previous revision, except in the 2d edit. Since the 4th edit. a number of new dyes for fluorescent microscopy have been introduced and about 25 more dyes are included. Staining procedures are omitted and published in a separate book.—*J. B. Paton.*

### LABORATORY APPARATUS AND TECHNIQUE

8065. Blake, G. G. (*Sidney U., Australia.*) An electromagnetic liquid flow control valve. *Chem. and Indust. [London]* 1946(5): 46. 1 fig. 1946.—A rubber seating (washer or one-hole rubber stopper) is opened or closed by the tapered end of a soft iron armature, the position of which is controlled by a solenoid encasing the tube.—*S. R. Ames.*

8066. Coudert, J., et Ch. Baud. Procédé de montage des échantillons parasitologiques dans les verres synthétiques. *Ann. Parasitol. Humaine et Comp.* 21(3/4): 177-182. 3 fig. 1946.—A method is described of embedding macroscopic specimens, such as ticks, insects, and helminths, in synthetic glass; so prep'd., they can be handled without damage and at the same time can be studied with a binocular microscope. The specimen is placed in a monomeric fluid which is polymerized with it in place. The fluids used were vinyl acetate, methyl acetate, and monomeric styrolene. Immediately before use the monomer is purified by distillation, the apparatus for which is described. After this, the process of polymerization is started by adding 3-5% of benzoyl peroxide to the fluid collected in the tube, and immersing the tube in a water bath which is boiled gently, until the liquid has the consistency of thick syrup. The medium so prepared may be preserved for several hours in a refrigerator, or may be used at once to embed the specimens. The specimens must have been prepared by dehydration, clearing

in toluene, then placing in two successive baths of the monomere. Arthropods can be dried and placed directly in the monomer. The medium, containing the specimen, is then placed in a mold, in which a layer of already polymerized medium has been put to keep the specimen from becoming flush with the surface of the final mount. The mold may be a large glass tube with flat bottom, which is broken to remove the block, or short tubes of glass or metal, from which the block can later be removed. The mold is closed hermetically and heated in an oven at 56°C. Polymerization may be completed in 24 hrs. or more. When the mold is put into cold water, the block can be separated from it. Finally, the block is finished with sand paper and polished.—*Harold Kirby.*

8067. Fischer, L. A new method for determining colors. *Kiserletügyi Közlemenyek* 46: 165. 1943.—The author describes a new apparatus, and a method of using it, with which colors can very rapidly be measured without error. The theory of the apparatus is discussed mathematically, and several examples are presented for recalculating the data obtained by Ostwald's method and the integration of the equation so obtained with those resulting from the new apparatus.—*S. A. Aroney.*

8068. Frings, Hubert. (*Gustavus Adolphus Coll., St. Peter, Minn.*) The mounting of living insects for observation and study. *Turtlox News* 24(9): 150-154. 4 fig. 1946.—Living insects are mounted in blocks of low melting-point paraffin wax on glass rods. Small specimens are mounted on strips of paraffin-soaked paper attached to glass rods. Mounted insects are fed and watered to keep them alive over long periods for experimentation or teaching purposes.—*R. W. Dexter.*

8069. Gaul, R. J., and J. V. Karabinos. (*U. San Francisco, Calif.*) Thiophene-free benzene. *Science* 10(2710): 557. 1946.—The Raney nickel desulfurization reaction is an excellent method to obtain thiophene-free benzene. In a typical expt. 100 mg. of benzene containing 1% thiophene was refluxed with 10 gm. of Raney nickel. After

15 mins. a benzene sample no longer gave the isatin-sulfuric acid color test for thiophene.—*H. M. Kaplan.*

8070. Grover, D. W. Physical and chemical methods for moisture determination. *Chem. and Indust. [London]* 1946(1): 7. 1946.—Physical methods included measurement of dielectric constant, electrical conductivity, and, where the moisture content isotherm was known, determination of the water vapor pressure. The employment of calcium carbide and Fisher's reagent were cited as frequently used chemical methods.—*S. R. Ames.*

8071. Lewis, Ralph W. (*Michigan State Coll., East Lansing.*) A simple osmosis apparatus. *Turtlox News* 24(10): 170-171. 1946.—Directions are given for preparing for individual students a cellulose tubing osmoscope which operates quickly.—*R. W. Dexter.*

8072. Macy, Ralph W. (*Reed Coll., Portland, Ore.*) Rack for staining jars. *Turtlox News* 24(10): 175-176. 1 fig. 1946.—A rack which holds 12 coplin jars and a row of medicine dropper pipettes is diagrammed and illustrated.—*R. W. Dexter.*

8073. Richardson, L. R. (*Victoria Univ. Coll., Wellington, New Zealand.*) Glass-racks for staining cover-slip preparations. *Turtlox News* 24(9): 158-159. 2 fig. 1946.—A staining rack is made from glass rods fused together, using 4 mm. rod for the main frame and 1.5 mm. rods for separating bars.—*R. W. Dexter.*

8074. Anonymous. The A. B. C. of pH control. 13th ed. 85p. Illus. LaMotte Chem. Prod. Co.: Baltimore, Md., 1944.

8075. Anonymous. Permeometer. *Indust. Equip. News* 14(10): 2. 1 fig. 1946.—Measures air flow through cloth, paper, porous material. Instrument operates as pneumatic bridge, measures in range of 1 to 400 cfm. per sq. ft. at pressure drop of 5 in. of water. Source: W. & L. E. Gurley, Fulton & Union Sta., Troy, N. Y.—*M. A. Raines.*

8076. Anonymous. Thermometer. *Indust. Equip. News* 14(10): 8. 1 fig. 1946.—Mercury-in-glass type. Glass tube is made in V-shape section with the apex facing forward. The result is magnification of mercury column to the full width of the tube. The back of the tube is colored yellow in width equal to the mercury. It shows through only above the mercury to form a sharp contrasting cutoff. For temps. to 750°F. Source: Philadelphia Thermometer Co., 4405 N. 9th St., Dept. Q., Philadelphia, Pa.—*M. A. Raines.*

8077. Anonymous. Thermostat. *Indust. Equip. News* 14(10): 18. 1 fig. 1946.—Employs mercury column in capillary tube to close or open control circuit through two platinum electrodes. Source: Washington Glass Lab. & Instrument Co., 3222 Georgia Ave. N. W., Washington 11, D. C.—*M. A. Raines.*

8078. Anonymous. Gage. *Indust. Equip. News* 14(10): 44. 2 fig. 1946.—Electronic equipment, with oscilloscope, to check diam. of wire, rod, tube. The head is positioned beside a moving wire, rod, tube, or filament to provide a continuous indication on the oscilloscope screen of diam. and variation, and of predetermined upper and lower tolerances in diam. Source: Raymond W. Wilmette, Inc., 236 W. 55th St., New York 19, N. Y.—*M. A. Raines.*

8079. Anonymous. Electronic radioactivity meter. *Indust. Equip. News* 14(10): 56. 1 fig. 1946.—"Autoscaler" supplies high-potential operating voltage for standard Geiger Mueller tube, counts impulses from this tube, measures time required for reception of given number of impulses. Companion instruments, "Blinker" and "Squawker", indicate presence of radioactive isotopes for simple quantitative work

as in identifying commercial products. Source: Tracerlab, Inc., 57 Oliver St., Boston 10, Mass.—*M. A. Raines.*

8080. Anonymous. Rotameter tube. *Indust. Equip. News* 14(10): 72. 1946.—New "bead-guide" tube employs three internal ribs integral with tube as a means to guide the "rotameter" float. Beads also provide view of float position when meter is handling opaque liquids. Source: Fischer & Porter Co., 93 County Line Road, Hatboro, Pa.—*M. A. Raines.*

8081. Anonymous. Frequency transcription. *Indust. Equip. News* 14(10): 77. 1 fig. 1946.—For checking distortion in audio equipment. Used in conjunction with an oscilloscope to provide a response-characteristic picture of the equipment. Reveals distortion, transient phenomena in a sweep-frequency range of 100 to 10,000 cps. Source: Clarkstan Corp., 11925 W. Pico Blvd., Los Angeles 34, Calif.—*M. A. Raines.*

## PHOTOGRAPHY

8082. Baldwin, S. Glidden. (*139 N. Vermillion St., Danville, Ill.*) Tree photography as a hobby. *Jour. Biol. Photogr. Assoc.* 15(2): 58-68. 34 fig. 1946.—Examples of the possibilities of tree photography for the student and hobbyist.—*O. W. Richards.*

8083. Hancock, Allan F. (*Jefferson Med. Coll., Phila.*) Peritoneoscopic photography. *Jour. Biol. Photogr. Assoc.* 14(4): 163-165. 2 fig. 1946.—A Robot camera was attached to the endoscopic apparatus to permit 24 pictures per winding. A side viewing telescope was used for observation and, at the time of exposure, it was swung out of the image beam and the light was over-voltaged by cutting out a resistance in the lamp circuit. Color film is recommended. With the cooperation of the patient, exposures of 6 seconds are possible and adequate.—*O. W. Richards.*

8084. Julin, Leonard A. (*Mayo Clin., Rochester, Minn.*) Cinematography of clinical and surgical subjects: A general consideration of equipment and technic. *Jour. Biol. Photogr. Assoc.* 14(4): 171-184. 20 fig. 1946.—A discussion of cameras (16 vs 8 mm.), lenses, technic, film and the special features of surgical photography, based on Mayo Clinic experience, is given to guide those interested in entering this branch of photography.—*O. W. Richards.*

8085. Lester, Henry M. (*101 Park Ave., N. Y. C.*) High-speed motion picture photography. *Jour. Biol. Photogr. Assoc.* 14(3): 107-118. 12 fig. 1946.—A special camera with a glass plate shutter and continuous film movement made possible exposures of  $1/15,000$  sec. 16 mm. motion picture film was used. The intense light needed was provided by rotating 17 flash lamps through a parabolic reflector and flashing them successively, so as to provide continuous light. The controls, uniformity of light and difficulties of this type of photography are discussed with respect to what may be accomplished for biological science.—*O. W. Richards.*

8086. Naidorf, Carrol P. (*Army Med. Illus. Serv., Washington, D. C.*) Medical photographic records. *Jour. Biol. Photogr. Assoc.* 15(2): 69-72. 1946.—A record system based on the Day Book, Patient Card Index, Medical Card Index and Negative File is described and illustrated.—*O. W. Richards.*

8087. Oliver, Clayton B. (*Wayne U. Coll. Med., Detroit.*) Designing a photo copying stand. *Jour. Biol. Photogr. Assoc.* 14(4): 167-170. 1 fig. 1946.—A home-made, wooden, vertical copying stand is described for a 5 × 7 camera.—*O. W. Richards.*

## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Eye color in Britain, 8036; Sickle-cell anemia in Brazil, 8051; Serum protein level of Indian soldiers, 8295; Serum albumin levels in Africans and Europeans, 8301; Flexion furrows in limbs at different ages, 8749; Biometry of human mastoid process, 8905; Development of occipital lobe, 8964; Skeletal anomalies, 9002; Formula for detn. of cranial indices, etc., 9061; Mammals in archeological sites, 10904)

8088. Beck, H., D. A. Collins, and H. E. Alexrod. (*U. California, San Francisco.*) The effects of a single massive dose of vitamin D<sub>2</sub> (D-Stoff therapy on oral or other tissues of young dogs). *Amer. Jour. Orthodont. and Oral Surg., Orthodont. Sect.* 32(8): 452-462. 13 fig. 1946.—Vitamin D<sub>2</sub> (450,000 i.u.) was administered to 5 pure-bred cocker spaniels of approx. 1 mo. of age. Severe pathologic changes were observed in the bones, teeth, lungs and kidneys of dogs following a single massive dose of vitamin D<sub>2</sub>. Osteoporosis of the mandible and malformation of the teeth which could be observed by x-rays could be confirmed histologically. Pathologic calcification has the same appearance in the dogs with short recovery periods as in those with long recovery periods. The dogs with recovery periods of approx. 8 mos. showed severely deformed dental roots. The fact that root formation continued shows that Hertwig's sheath is resistant to the toxic effects of hypervitaminosis D<sub>2</sub>. The decid. teeth, being present in the dogs for short periods, showed no evidence of pathologic calcification of the pulp tissue. Pathologic calcifications were observed in the lungs and kidneys of the dogs with the shortest recovery period but not in the liver. These expts. show that, until max. tolerance doses are established, the admin. of amts. of vitamin D should be made with caution.—D. C. Lyons.

8089. Beck, H., D. A. Collins, and R. M. Freytag. (*U. California, San Francisco.*) Changes in the oral structures in the dog persisting after chronic overdoses of vitamin D. *Amer. Jour. Orthodont. and Oral Surg., Orthodont. Sect.* 32(8): 463-471. 6 fig. 1946.—Daily excessive doses of vit. D<sub>2</sub> and D<sub>3</sub> administered for a 5-mo. period to young dogs produced profound pathologic changes including malformation and deformation of tooth roots and pathologic calcifications of the pulpal tissues of the paradentium hypercementosis pulp stone formation and advanced paradentosis. These changes persisted even after a recovery period of a similar duration with no evidence of healing or repair.—D. C. Lyons.

8090. Broom, R., and G. W. H. Schepers. The South African fossil ape-men. The Australopithecinae. *Transvaal Mus. Mem.* 2. 1-272. 13 pl., 40 fig. 1946.—Broom reports on the skeletal remains of *Australopithecus africanus* (Taungs), *Plesianthropus transvaalensis* (Sterkfontein), and *Paranthropus robustus* (Kromdraai), all of the same family, Australopithecinae. Taungs is "in the lower part of the Upper Pliocene, or perhaps even in the Middle Pliocene"; Sterkfontein is Upper Pliocene; Kromdraai is Lower Pleistocene. T. is represented by an incomplete skull at M1 stage. S. is represented by parts of four skulls: S1, most of the base of the skull, right and left maxillae, other face bones (a young ♂); S2, a maxilla (ad. ♀); S3, a "crushed and fragmentary skull" (old ♂); S4, a jaw. S. is represented further by the distal end of a femur, part of a first phalanx, and one carpal bone (capitate). K. is represented by an almost complete skull, the lower end of a R. humerus, part of the upper end of a R. ulna, some bones of the L. hand, 2 toe bones and a talus. Broom feels that the remains, as a whole, suggest "that the Australopithecinae separated from the typical 'anthropoids' probably as early as Lower Oligocene, and that the earliest hominids arose from an Australopithecine only in the Pliocene." Schepers studies the endocranial casts of these 3 fossils in considerable detail: morphological features, endocranial contours and vascular patterns, and metrical features. On the basis of such analyses S. concludes that the fossils "must have been virtually true human beings, no matter how simian their external appearance may have remained." There are several good photographic plates, but the line-drawings do not do justice to the material, either in general delineation or in precision of detail.—W. M. Krogman.

8091. Collins, D. A., H. Beck, M. E. Simpson, and H. M. Evans. (*U. California, San Francisco.*) Growth and transformation of the mandibular joint in the rat. II. Hypophysectomized female rats. *Amer. Jour. Orthodont. and Oral Surg., Orthodont. Sect.* 32(8): 445-446. 4 fig. 1946.—The

mandibular joint was studied in 79 hypophysectomized ♀ rats at post-operative intervals ranging from 4 to 645 days. The transformations observed were those similar to what might be expected in aging rats. The changes occur, however, much earlier in the hypophysectomized group. Chondrogenesis is considerably slowed within 4 days after the operation. Ossification of the mandible by 28 days after the operation is found to be similar to that found in the 258-day-old normal rat. In the normal rat some uncalcified cartilage remained in the condyle.—D. C. Lyons.

8092. Collins, D. A., H. Beck, M. E. Simpson, and H. M. Evans. (*U. California, San Francisco.*) Growth and transformation of the mandibular joint in the rat. III. The effect of growth hormone and thyroxin injection in the hypophysectomized female rat. *Amer. Jour. Orthodont. and Oral Surg., Orthodont. Sect.* 32(8): 447-451. 5 fig. 1946.—Group processes in the senescent mandible joints of hypophysectomized rats may be restored to normal vigor by the administration of pituitary growth hormone. Thyroxin given in this expt. did not re-inactivate growth and when injd. simultaneously, the growth hormone inhibited the response to be expected from the growth hormone. This is in contrast to the findings reported in a previous article, that thyroxin augmented the action of growth hormone osteogenic processes at the proximal epiphyseal cartilage in the tibia of white rats. The response of the cartilage covering the head of the tibia was entirely comparable to that of the mandibular joint. Either the hormonal control of var. points of growth must be different or the amts. of these hormones necessary for facilitating osteogenic processes differ.—D. C. Lyons.

8093. Entwistle, A. R., J. F. Marshall, and R. A. Wilson. Notes on the dental condition of West African natives. *Brit. Dental Jour.* 80(5): 164-166. 1946.—Observations on abnormal dental conditions and tooth mutilations of W. African natives are reported.—J. G. Godwin.

8094. Friant, Madeleine. (*École Anthropol., Paris, France.*) L'os prémaxillaire du Gorille. Un stade de son évolution ontogénique. *Acta Anat. [Basel]* 2(1): 33-39. 4 fig. 1946.—Examination of an unspecified number of young gorilla skulls showed that the premax. is, in general, formed on the external (facial) surface by two pieces, the endo- and exo-premaxillae. The intra-incisive suture, which separates them, always passes between the two decid. incisors, and disappears most commonly when the perm. teeth erupt, but often later. It does not seem as important as P. Albrecht stated. Among mammals it is found only in primates and in them it is never prolonged on the buccal side. It seems to have the same significance as the suture which, during human and gorilla development, separates the canine bone (when present) from the rest of the maxilla.—Donald Mainland.

8095. Hall, E. Raymond. (*U. Kansas, Lawrence.*) Zoological subspecies of man at the peace table. *Jour. Mammal.* 27(4): 358-364. 2 maps. 1946.—The many races of man are tentatively grouped into 5 subspecies. Evidence is given in illustration of the thesis that morphol. and physiol. diffs. distinguishing subspecies of man are of the same magnitude and nature as the diffs. used in separating subspecies of other kinds of mammals. Competition between subspecies of lower mammals is considered in instances where one is introduced into the geographic range of another and when a subspecies from a small land mass competes with another subspecies from a large land mass. The eventual results are shown to be extinction of one or amalgamation of the two. Either result is held to be a painful process, provocative of conflict. It is suggested that where subspecies (not races) of man are concerned the painful process and chances of conflict (war) would be minimized by adhering to nature's law of allowing only one subspecies of a given species in one area. It is recommended that the United Nations Organization use information derived from a zoological study of subspecies along with information gained from a study of



commerce, politics, religion and the historical record, when new political boundaries are being decided upon.—E. R. Hall.

8096. Mendels, J. (*Psychiatric Inst. "Het Apeldoornsche Bosch", Apeldoorn, Netherlands.*) Over het normale lichaamsge wicht. [Normal body-weight.] *Voeding* 3(4): 151-156. 1941/42.—Records of body-wts. of 210 ♂♂ and 210 ♀♀, taken over a period of several yrs., refute Schall's claim that the body-wt. of ♀♀ is 17.1% less than that of ♂♂ of the same height and age. The author found a difference of only 0.5%.—P. L. Hoogland.

8097. Reynolds, Earle L. (*Antioch Coll., Yellow Springs, Ohio.*) Sexual maturation and the growth of fat, muscle and bone in girls. *Child Development* 17(3): 121-144. 1946.—This paper describes a study to test whether measurements of tissue breadth in one anatomic area are sufficiently sensitive to be used in the study of human growth. Using 48 girls, the relationship of breast development (maturation criterion used) to the changing patterns of fat distribution, muscle, and bone breadths in the leg is reported. At every age level between 7½ and 12½ yrs. early-maturing girls exceeded late-maturing in mean ht. and wt., and showed a higher rate of gain in total breadth of calf and in the breadths of fat, muscle, and bone of the calf. Early-maturing girls showed a higher growth rate for muscle and a lower growth rate for bone breadth than for total breadth of calf, and a greater variability in total calf and muscle breadths and less in fat and bone breadths. Certain observations of differences in tissue patterns between 17 early-maturing and 13 late-maturing boys are included. That the external dimensions and total body wt. give no reliable indication of distribution of tissue components or of their changing relationships is discussed.—Elizabeth Hyde.

8098. Rusconi, Carlos. La piorrea en los indigenas prehispanicos de Mendoza. [Pyorrhea in the pre-Spanish inhabitants of Mendoza.] *Rev. Odontol. [Buenos Aires]* 34(4): 118-121. 1946.—Frequency of dental caries and pyorrhea in the pre-Spanish adult skulls at the Museum of Natural History of Mendoza was studied. Of the 107 skulls, 32.6% had varying amts. of caries. Of the 75 carious areas, 61 were in the cervical area and 14 originated in the crown. Skulls from the Las Barrancas area had the least caries and those from Osario, San Carlo and El Paraiso, the most. 19 of the skulls showed evidence of pyorrhea. All but 3 of these were from Osario and Las Barrancas.—J. F. Volker.

8099. Steinberg, Arthur G. Heterogenic growth in man: The radius and tibia. *Anat. Rec.* 96(4): 16-17. 1946.—An abstract.

8100. Stuart, Harold C. (*Harvard Sch. Publ. Health, Boston, Mass.*), and Howard V. Meredith. (*U. Iowa, Iowa City.*) Use of body measurements in the school health program. *Amer. Jour. Publ. Health* 36(12): 1365-1386. 1946.—Measurements serve as adjuncts to the physical examination, helping the physician to recognize and describe more precisely individual physical characteristics and abnormalities and to evaluate the progress being made in growth. Since much is now known as to how children grow and how they differ among themselves in size, build and amts. of body tissues, as well as in their rates of growth, and since normal distribution values are now available, the interpretation of measurements has been greatly facilitated. Measurements do not reveal the cause or health significance of unusual size or rate of growth. Recognition of these factors comes only from the evaluation of measurements in conjunction with a health history and physical examination. The recognition of retarded growth or poor physical status should lead to a search for any dietary, environmental or habit factors or illnesses which may have influenced progress adversely. If constitutional factors appear to explain a child's characteristics, their recognition should lead to a regime suited to his particular needs. In the school situation, measurements may be instrumental in leading to needed examinations and appropriate medical care. Their purpose is primarily to aid in the discovery of those children who are in poor or questionable

physical health or nutritional state. The attributes which measurements should reveal are overall body size, the stockiness of the bony skeleton, the bulkiness of the musculature and the quantity of skin and subcut. tissue. Wt., height, hip width (pelvic breadth), chest circumference and leg girth (i.e., calf circumference) are chosen by the authors for these purposes and are to be supplemented by clinical evaluations of the thickness of folds of skin and subcut. tissue in 2 locations. The principal methods of using measurements in schools are considered from the standpoints of their advantages and limitations. Height and wt. alone are not adequate. It is desirable to consider individual measurements in relation to their norms as well as in relation to each other. Taking other measurements, or dealing with those recommended in other ways, may increase their value but the procedures described are considered to be as brief, simple and informative as the usual limitations of school examinations require or permit. The procedures to be followed in taking the measurements recommended are described in detail as well as the norms which are to be used in interpreting them. A table gives 5 percentile values for each of 5 measurements for each sex and by half year of age from 5 to 18 yrs., inclusive. A form is given for recording the measurements themselves and their percentile positions at 20 ages. This form also allows for recording the clinician's evaluation of the amt. of skin and subcut. tissue on a 5-point scale. One figure for boys and one for girls are shown on which an individual's measurements may be plotted throughout the school yrs. These reveal at a glance the course of a child's progress in each measurement in relation to the range of normal variability. Several examples are given which show the methods of finding and interpreting percentile positions and their possible significance.—Authors.

8101. Tottenger, F. M. Fragmentation and scarring of the tarsal and metatarsal bones; an index of dental deformity. *Amer. Jour. Orthodont. and Oral Surg., Oral Surg. Sect.* 32(8): 486-515. 47 fig. 1946.—The author demonstrates by means of x-ray studies, the effect of malnutrition upon the human skeleton. It is found that the skull of the new born baby is an index to the future health of the child. The allergic child shows marked bone damage to the bones under stress at the time they are experiencing their most rapid growth. Fragmentation of the bones of the lower extremities occurs most commonly in the child in the period of life from 3 mos. of age up to approx. 6 yrs. It reaches the max. between the 3d and 4th yr. The first evidence of fragmentation of the bones of the allergic child may be seen as early as the 3d month, reaching a max. between the 3d and 4th yr. This fragmentation is early noticeable in the epiphysis and the heads of the metatarsals which may be delayed in appearance. Fragmentation of the bases of the metatarsals is often present and the navicular, cuboids and the 3 cuneiform bones may be laid down with many fragmented centers of ossification. These tend to heal so that by 6 yrs. of age only the scars resulting from fragmentation are present. These scars consist of a thickening or internal condensation of the trabeculae in the tarsals and the bases of the metatarsal bone. Later on, however, at about 10 or 12 yrs. of age, as the epiphysis at the base of the 5th metatarsal appears, further evidence of fragmentation of the foot may be seen. The scars that are laid down in these bones during periods of fragmentation apparently carried on into adult life. The author has been able to follow evidence of this scarring as long as 7 yrs. after the process is largely healed. Regarding the development of the orbital and maxillary arches, the author found the same factors at work in the human being as he found experimentally in the cat. There is a narrowing of the trans. diam. between the lateral and orbital prominences. Failure in the forward movement of the prominences or a combination of conditions may occur in an individual. In a group of children in which he has been able to observe for a number of yrs., improvement in facial development was noticed due solely to intake of growth promoting factors in foods.—D. C. Lyons.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; Geriatrics; and: History of eunuchism, 7917; Genetic concepts and folie à deux, 8042; Sickle-cell anemia in Brazil, 8051; Statistical methods for death probability in closed population groups, 8063; Serum protein level of Indian soldiers, 8295; Serum albumin levels in Africans and Europeans, 8301; Vitamin A nutrition, Rotterdam, 8351; Fat consumption, Holland, 8380; Nutrition for young and old, 8391; Nutrition and the war, 8392; Water, salt and heat exchange in tropics and deserts, 8455; Obesity-gigantism, 8475; Treatment of epilepsy, 8476; Neuro-endocrine effects, 8479; Congenital anomalies following maternal rubella in pregnancy, 8535; Physiology of adolescence, 8628; Nutrition and fetal development, 8754; Nutritional defects in infancy, 8758, 8766, 8767, 8768; Pneumonia in the aged, 8792; Congenital hemolytic jaundice in Negroes, 8819; Endemic pellagra in Portugal, 8832; Exptl. neuroses and alcoholism, 8860; Effect of topical applications of NaF to children, 8878; Dental conditions in various regions, U. S., 8881; Increase of tuberculosis mortality in non-white adults, U. S., 9390; Housing problem in Britain, 9412; Elimination of tuberculosis mortality, 9417; Ainhum, 9428; Malaria in the U. S., 10434)

## POPULATION, FERTILITY, VITAL STATISTICS

8102. Cook, S. F. (*U. California, Berkeley.*) Human sacrifice and warfare as factors in the demography of pre-colonial Mexico. *Human Biol.* 18(2): 81-102. 1946.—In Central Mexico, immediately prior to the Spanish Conquest, the population was reaching the maximum consistent with the means of subsistence. Simultaneously the intensity of warfare rose steadily and the institution of human sacrifice, which depended for victims largely upon war captives, underwent an almost pathological development. An analysis of contemporary documentary sources reveals that the mean annual number of battle casualties reached approx. 5,000 and the corresponding value for sacrificial victims 15,000 during the last half century of Aztec domination. Assuming a probable final population for the area of at least 2,000,000, and a normal death rate of 50 per thousand, the effect of warfare and sacrifice would have been very effective in checking an undue increase in numbers. The suggestion is advanced that these methods may have been developed as a group, or social, response to the need for population limitation.—S. F. Cook.

8103. Dunn, Halbert L. (*U. S. Publ. Health Serv., Washington, D. C.*) Record linkage. *Amer. Jour. Publ. Health* 36(12): 1412-1416. 1946.—The importance of complete, accurate compilation of vital records to the state, social agencies, and the individual concerned is briefly discussed, with a 7-point outline of the Canadian system. A life record index with birth card and number is advocated for nation-wide state and federal linkage; this should include birth, marriage, divorce, adoption, etc., wherever occurring.—G. B. Landerkin.

8104. Karpinos, Bernard D. Use of life table death rates for comparative mortality. *Human Biol.* 18(2): 127-131. 1946.—The paper states briefly the underlying assumptions of the direct method of mortality standardization, and illustrates, by concrete examples, the shortcomings of the life table death rates for comparative study of mortality.—B. D. Karpinos.

8105. Anonymous. Fertility of American and Canadian women. *Statist. Bull. Metropolitan Life Insurance Co.* 27(9): 9-10. 1946.—In 1941, U. S. white women aged 15-19 had a birth rate >46% above that of Canadian women. At older ages the latter had the higher rate, their excess ranging from 3% at ages 20-24 to 137% at ages 40-44. If Quebec women are excluded the differentials are substantially smaller at all ages except 20-24.—P. K. Whelpton.

8106. Anonymous. Postwar mortality at new low. *Statist. Bull. Metropolitan Life Insurance Co.* 27(10): 3-5. 1946.—The age adjusted death rate for the Company's industrial policyholders was lower during the first 9 months of 1946 than during the same months of any prior yr. Since 1942 the relative decline for white ♂♂ (5.6%) is <3/5 of that for white ♀♀ (9.5%). Decreases of 10% or more occurred for white ♂♂ aged 0-4, 10-14, and 25-44, and for white ♀♀ aged 10-64.—P. K. Whelpton.

8107. Anonymous. Childhood diseases conquered. *Statist. Bull. Metropolitan Life Insurance Co.* 27(10): 6-8. 1946.—The 1941-45 death rate from diphtheria and that from scarlet fever among the Company's industrial policyholders are only 4% of the 1911-15 rates. The % for measles is 7, and that for whooping cough 9.—P. K. Whelpton.

8108. Anonymous. A quarter-century of insulin. *Statist. Bull. Metropolitan Life Insurance Co.* 27(10): 8-10. 1946.—Thanks primarily to insulin the death rate from diabetes mellitus has been reduced about 1/3 at ages 35-44 and in much greater degree at younger ages. Because diabetics live longer than formerly, the death rate from the disease has risen substantially at ages 65-74.—P. K. Whelpton.

8109. Anonymous. Thirty-five years of progress in reducing mortality. *Statist. Bull. Metropolitan Life Insurance Co.* 27(11): 3-7. 1946.—Among the Company's industrial policyholders, the age-adjusted death rates per 100,000 (excluding deaths from enemy action) were as follows in 1911-15 and 1941-45: white, ♂ 1,418 and 699, ♀ 1,061 and 456; colored, ♂ 1,867 and 923, ♀ 1,707 and 796. Percentage declines vary from >80 at ages 1-4 to <40 at ages 65-74.—P. K. Whelpton.

## ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

8110. McCartney, J. L. White men in the tropics. *Dis. Nerv. System* 5: 132-138. 1944.—The effect of tropical climate on white men is discussed in general. "The cerebral depressive effect of alcohol allows them to escape from unpleasant psychoneurotic ideology." The ideology referred to is the psychogenic mechanism which follows overindulgence in sex activity, bringing with it guilty feelings and conflicts in the white man. Indulgence in alcohol leads to overindulgence. "Chronic alcoholism leads to chronic congestion of the brain tissue and multiple neuritis. This condition is aggravated by hot weather."—*Courtesy Quart. Jour. Stud. Alcohol.*

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Thermotaxis in animals, 8128; Factors determining activity, Helix, 8135; Bird flyways, 8176; Simple reflexes in decerebrate crayfish, 8591; Gasping reflex, isolated rat head, 8608; Fibrinolysis in relation to alarm reaction, 8849; Exptl. neuroses and alcoholism, 8860; Mating orders, *Ceratitis capitata*, 10325; Activity of honeybee, 10386; Honeybee queens, 10400; Dispersal of tsetse fly, 10521; Reproduction in fish, 10738; Aggregations in tadpoles, 10789; Mating behavior of garter snake, 10815; Feeding of sparrows, 10883; Fishing by jaguar, 10905; Migration of Arctic squirrels and lemmings, 10913)

8111. Chadwick, L. E., and V. G. Dethier. (*Edgewood Arsenal, Aberdeen, Md.*) The relationship between chemical structure and the response of blowflies to tarsal stimulation by aliphatic acids. *Anat. Rec.* 96(4): 53. 1946.—An abstract.

8112. Crombie, A. C. (*Cambridge U.*) On the measure-

ment and modification of the olfactory responses of blowflies. *Jour. Exptl. Biol.* 20(2): 159-166. 4 fig. 1944.—Two spp. of blowfly were used, *Calliphora erythrocephala* and *Lucilia sericata*. All the olfactory tests were carried out at 23°C and 70% R.H., in the absence of light. The accuracy of the control of the olfactory stimulus was tested by balancing

olfactory and visual stimuli of different intensity. This demonstrated that a reasonably accurate control of the intensity of the olfactory stimulus was achieved, and also disclosed some facts about the quantitative relationship of stimulus to response. The flies are normally repelled by menthol but their response to the odor of menthol was modified when they first experienced it in the larval stage or immediately upon emergence. The memory of an experience in the larval stage thus survives metamorphosis and affects adult behavior. Most of the flies then became 'habituated' to the odor, but in one case they appear to have become 'conditioned'. The latter may be a case of 'latent learning'. There was no modification of the response of adults which first experienced the odor when they were several days old. The populations of habituated or conditioned flies were not homogeneous. Different samples of populations which seemed at first to be indifferent to the odor of menthol often proved to respond differently, some being repelled by it, others indifferent or even attracted to this odor.—C. H. Beatty.

8113. Dethier, V. G., and L. E. Chadwick. (Ohio State U., Columbus.) Rejection thresholds of the blowfly for a series of aliphatic alcohols. *Anat. Rec.* 96(4): 52-53. 1946.—An abstract.

8114. Finkenbrink, W. (Frankfurt a. M.—Höchst, Germany.) Versuche über das Fortbewegungsvermögen der Eilarven des Hausbocks (*Hylotrupes bajulus* L.). *Anz. Schädlingsk.* 16(4): 41-43. 1940.—Expts. with newly hatched larvae of this destructive cerambycid beetle demonstrated that the insects can travel at least 24 cm. during the course of 4-11 days before hitting upon a suitable site for boring in. One larva traveled 7.5 cm. in 24 hrs. over a perfectly smooth and flat surface; all moved aimlessly, unable to sense the direction of a wooden block placed 24 cm. away. Thigmotropic reactions were positive and strong; larvae

attempting for hours to bore into rusted spots on otherwise polished metal surfaces.—R. B. Swain.

8115. Scott, J. P. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Maine.) "Normal" reactions to the frustration of fighting in an inbred strain of mice. *Genetics* 31(2): 229. 1946.—An abstract.

8116. Skutch, Alexander F. (San Isidro del General, Costa Rica.) The parental devotion of birds. *Sci. Month.* 62(4): 364-374. 1946.—Several personal observations are given of the defense of their nests by birds against man and other predators, but in none of the observed cases did the parent birds lose their lives. It is concluded that natural selection has established effective limits to the instinct of defending the young.—H. F. Copeland.

8117. Weiss, Harry B. (New Jersey Dept. Agric., Trenton.) Insects and the spectrum. *Jour. New York Ent. Soc.* 54(1): 17-30. 1946.—A review of past and recent literature on insect behavior to various wave-lengths, with bibliography. It is concluded that of the two constituents, wave-length and intensity, the latter seems to be the most important in producing reactions in insects.—H. B. Weiss.

8118. Winder, C. L., and Calvin P. Stone. (Stanford U., Calif.) Reduction of general activity in male albino rats from electro-convulsive shocks. *Proc. Soc. Exptl. Biol. and Med.* 63(1): 19-21. 1946.—A series of daily electro-convulsive shocks in 13 ♂ rats, for 5-day periods, significantly reduced concurrent activity in revolving drums as compared with (1) preshock activity, (2) 5-day periods of no-shock interposed between periods of shock, and (3) the post-shock recovery period. There was a cumulative effect of successive periods of shock. The mean level of activity reached during the post-shock period of 30 days was significantly lower than that of the preshock period. Whether this difference was due to natural decline of activity with age or to lingering effects of electro-convulsive shock was not detd.—C. P. Stone.



# ECOLOGY

Editors

ORLANDO PARK, *General Animal Ecology*

G. D. FULLER, *General Plant Ecology*

G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL and ANIMAL ECOLOGY]—Fish associations, 8168; Effect of spray programs on fauna of apple orchard, 10335; Environmental control of tsetse fly, 10524; Transport of Anopheles, 10527; Microfauna of Canadian mosses, 10541; Distr. terms defined, 10599; Arachnida, 10625; Parasitic Diptera of caves, 10670; Hemiptera of Morocco, 10676; Ants in Norway, 10688; Fungus-growing ants, 10702; Lizard population, 10846; Birds of Belgium, 10873; Rat population studies, 10891; Snowshoe rabbit cycles, 10892; Kangaroo rat, 10895; Brown rat, 10912. [PLANT ECOLOGY]—Root nodules on Alnus, 9485; Pollen analysis in the school curriculum, 9618; Mannia fragrans, 9696; Transplanting grasses, 9824; Forage resources of Argentina, 9831; Influence of severe frost on turf spp., 9833; Fertilizing and frequent clipping as affecting pasture yields, 9834; Soil erosion in India, 9912; Soil biota, 9948; Regeneration of oak in Scotland, 10098; Photosynthesis under diff. light conditions, pine, 10155; Measurement of absorption and reflection spectra of leaves, 10156)

## GENERAL

8119. De Beaufort, L. F. (*Zool. Mus., Amsterdam, Holland.*) Plants in relation to animal distribution. *Blumea* Suppl. 2. 108-112. 1942.—Animals depend on plants for food, shelter and oxygen. The distr. of land animals depends largely on the vegetation, less so for aquatic animals since the chief vegetable food (phytoplankton) is not restricted to circumscribed localities, and shelter is less than on land, as sessile animals are more important here than plants. In fresh water, the relations are somewhat the same as in the sea, but production of oxygen plays here a much greater part. The influence of isolation on the development of new species of plants and animals is well known, as is also the conservation of primitive types. The effect of the evolution of plants in an area on the evolution of animals is a speculative subject. The necessity of cooperation of botanists and zoologists in the study of distr. is emphasized.—L. F. de Beaufort.

8120. Dexter, Ralph W. (*Kent State U., Ohio.*) Ecology—hub of the pure and applied natural sciences. *Amer. Biol. Teacher* 8(3): 56-58. 1 fig. 1945.—Science of ecology brings together and unifies mathematics, chemistry, physics, botany, zoology, geology and climatology; application of ecology is basis of conservation and management of water, soil, forest, grassland, wildlife, and aquatic resources and agriculture.—R. W. Dexter.

8120A. Hopp, Henry. Earthworms fight erosion, too. *Soil Conserv. U. S. Dept. Agric.* 11(11): 252-254. 1946.—Data are presented to indicate the extent to which earthworms contribute to aggregate development. Some conditions favoring earthworm multiplication in the soil are summarized.—E. Winters.

8121. Lengerken, H. v. Ecto- und Endosymbiosen zwischen phytophagen Käfern, Pilzen und Bakterien. [Ecto- and endosymbioses between phytophagous beetles, fungi and bacteria.] *Biol. Gen. [Vienna]* 16(1/3): 408-433. 1942.—A review.

8122. Thienemann, A. Von Wesen der Oekologie. Ein Vortrag. [The nature of ecology. A lecture.] *Biol. Gen. [Vienna]* 15(3/4): 312-331. 1941.

## BIOTRIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Effect of tropical climate on white men, 8110; of desiccation on wheat stem sawfly, 10314; Periodicity of light intensity as ecol. factor, 8129; Water, salt and heat exchange in tropics and deserts, 8455; Meteorological conditions as affecting microorganism, 9111; Altitude and proneness to allergy, 9183; Altitude spring frost, and apple yields, Ohio, 9960; Limits of potato cultivation, 10013; Weather factors affecting fruiting and flowering by *Cryptostegia*, 10090; Climate of Tenerife, 10113; Measurement of absorption and reflection of spectra of leaves, 10156; Weather and plant disease, 10233, 10287; Moisture relationship of wheat stem sawfly, 10315; Weather factors affecting honey production, Michigan, 10392)

8123. Grover, J. Some problems of semi-arid areas. *East African Agric. Jour.* 11(3): 133-138. 5 fig. 1946.—The rainfall distribution of E. Africa is considered with possible methods of conservation.—T. M. McCalla.

8124. Grundy, F. Conservation of water for storage underground. *East African Agric. Jour.* 11(3): 139-144. 1946.—Water conservation by impounding flood waters in reservoirs and dams is discussed. Increasing the amt. of water entering the soil by different techniques is also considered.—T. M. McCalla.

## ANIMAL

8125. Errington, Paul L. Predation and vertebrate populations. *Quart. Rev. Biol.* 21(2): 144-177; (3): 221-245. 1946.—This is an appraisal of the effects of predation on populations of vertebrates. After distinguishing between more or less inexorable factors underlying the vulnerability of a population to predation, and responsiveness of predators that may be symptomatic of vulnerability, the conclusion is reached that a great deal of predation is without substantial depressive influence. In the sense that victims of one agency miss becoming victims of another, many types of loss are intercompensatory in the net effect. Large depressions of populations of mammals and birds through predation are usually linked with exploitation by man, and by the agency of the dog family. On the whole, in view of the tendencies to overestimate the effects of predation, a scaling down of emphasis appears in order.—Alfred Brauer.

8126. Franz, H. Die Tiergesellschaften hochalpiner Lagen. [Animal communities of high alpine sites.] *Biol. Gen. [Vienna]* 18(1/2): 1-29. 7 fig. 1944.—Communities of invertebrates are described, chiefly on the basis of studies in the Hohe Tauern (Salzburg, Carinthia, Austrian Alps). The lower forest zone is characterized by typical hardwood forest animals, the subalpine forest zone, including the *Pinus mughus* zone (coniferous forest), is equally characterized by many small animals. The upper border of the dwarf shrub zone, or transition zone, marks the limit for reptiles, Oniscidae, ants, and some small animals of the forest soil fauna; the heliophilic inhabitants of high alpine meadows are least abundant here. The high alpine grassy heath zone is the habitat of numerous exclusively high alpine animals that have a resemblance to steppe forms. The pulvinous plant zone, or subnival-nival pioneer zone, is poor in spp. and individuals. The communities are classified as follows: I. Subnival-nival pioneer communities: 1) the community of the snow ground cover above the grass heath limit, 2) the community of the sandy debris slope above the turf limit, 3) the community of the high alpine pebble and boulder slope, 4) the community of the sandy glacial and stream deposits; II. The communities of the high alpine grass heath zone: 1) the community of the high alpine grass heath, 2) the community of the snow furrows; III. The communities of the dwarf shrub gradient: 1) the community of the meadows and pastures of the dwarf shrub zone, 2) the community of the Rhododendron and Vaccinieta of the dwarf shrub zone.—Max Onno.

8127. Key, K. H. L. The general ecological characteristics of the outbreak areas and outbreak years of the Australian Plague Locust (*Chortoicetes terminifera* Walk.). *Australian Council Sci. and Indust. Res. Bull.* 186. 1-127. 1945.—The occurrence of locust "outbreaks" is related in particular to the factors of climate, soil, and vegetation. All 3 factors are interrelated and as a consequence "outbreaks" are re-

stricted to certain areas of Australia. The criteria are presented for the particular kind of semi-humid climate favorable to locust reproduction. Soil associations including "self-mulching" (granular) and compact soils were found more favorable to locust reproduction than large expanses of relatively uniform soil. Three maps are presented to show climate, soil and locust distribution. Clearing the land of shrubs and small trees often results in locust "outbreaks" in regions of favorable climate and soil associations. 16 photographs are included to illustrate soil and vegetative conditions. The importance of locust ecology in predicting and controlling future "outbreaks" is emphasized.—*E. Winters*.

8128. Konrad, Herter. Die Beziehungen der Oekologie und der Thermotaxis der Tiere. [Relations between ecology and thermotaxis in animals.] *Biol. Gen.* [Vienna] 17(1/2): 243-309. 3 fig. 1943.—A review.

8129. Konsuloff, St. Die periodischen Erscheinungen bei den Tieren und der Einfluss des Lichtes. [Periodical phenomena in animals and influence of light.] *Biol. Gen.* [Vienna] 17(1/2): 197-203. 1943.—Periodicity in light intensity is the chief external factor regulating periodic phenomena in warm-blooded animals, such as reproductive period, bird migration, seasonal development of endoparasites, etc. Expts. on guinea pigs showed that vit. D<sub>2</sub> is one of the substances produced in the skin under the influence of light, and influences in turn, by way of the hypophysis, the action of the gonads, which determines sex pigmentation around the mammary glands.—*Max Onno*.

8130. Miller, Milton A. (*U. California, Davis*.) Reproductive rates and cycles in the pocket gopher. *Jour. Mammal.* 27(4): 335-358. 1946.—About 2300 gophers (*Thomomys bottae navus*) were collected throughout the year from cultivated land in the Sacramento Valley, Calif., and examined for various indications of breeding. Year-long breeding occurs with peaks in fertility in spring, summer, and winter. Spring is the principal breeding season. Summer breeding is mainly by small-sized ♀♀, possibly those born the preceding spring. Fertility is low during autumn. Winter breeding is variable. Size and position of testes are unreliable indicators of breeding. Testes tend to be smaller and scrotal during the hot summer period, larger and abdominal in winter. Testes in juveniles average relatively smaller than in adults, but undergo parallel size changes. Descent of testes may occur early in life, and they are frequently scrotal in juveniles. The average adult ♀ is potentially capable of bearing more than 3 broods per year, but produces about 2. Estimates of litter size range between 4.92 and 5.77, mean number of fetal sites and of small embryos per female, respectively. Decrease in litter size with advance in pregnancy is attributed to fetal resorption. Fertility increases with size of ♀, but may decline in old age. Gophers in irrigated alfalfa fields are significantly more prolific during summer than those in non-irrigated lands, but no such difference was observed in spring when green forage was available to both groups. An effect of nutrition on breeding is indicated.—*M. A. Miller*.

8131. Mühlmann, H. Die rezente Metazoenfauna der Harzer Höhlen und Bergwerke. [The recent metazoa fauna of the Harz caves and mines.] *Zoogeographica* 4(2): 187-251. 1941.—27 chalk and gypsum caves from the alluvium or diluvium, and 3 mines, were investigated. Their faunas can have immigrated only in the postglacial period, save for supposed glacial relicts. The various caves and mines are described and their inhabitants listed. 128 spp. and vars. are enumerated. These belong to the following groups: Turbellaria (4), Nematoda (1), Oligochaeta (11), Copepoda (7), Isopoda (2), Amphipoda (6), Myriapoda (13), Collembola (33), Trichoptera (3), Lepidoptera (1), Diptera (17), Coleoptera (1), Araneida (3), Ixodidae (1), Mollusca (18), Amphibia (1). These include about 12 trogloliths, about 42 trogloliths, and about 60 trogloliths. The moisture in underground biotopes is considered most important among physical factors, and temp. of only secondary importance. The author holds that the theory of cold stenothermy of the cave fauna is untenable. Darkness is a factor of least importance. Use and disuse (Lamarckism) do not bring about development of typical cave characteristics, but a combination of mutation and ecological selection (Darwinism) is responsible.—*O. Steinbock*.

8132. Orr, Paul R. Heat death. *Biol. Bull.* 91(2): 232. 1946.—This study is in 3 parts: I. Time-temperature relationships in marine animals; II. Differential response of the entire animal (*Rana pipiens*) and several of its organ systems; III. The effect of high temps. on heart rate in *Venus mercenaria*.

8133. Rasquin, Priscilla. Progressive pigmentary regression in fishes associated with cave environments. *Anat. Rec.* 96(4): 82-83. 1946.—An abstract.

8134. Stickel, Lucille F. (*U. S. Fish and Wildlife Serv., Bowie, Md.*) The source of animals moving into a depopulated area. *Jour. Mammal.* 27(4): 301-307. 2 maps. 1946.—The *Peromyscus leucopus noveboracensis* population of a 17-acre study plot in a bottomland forest area on the Patuxent Research Refuge in Maryland was exhaustively live-trapped over a 7-day period. All individuals were marked and released. From data thus secured, range localities of the individual mice were mapped and the population was calculated to be between 6 and 7 adult mice per acre, with nearly equal numbers of ♂♂ and ♀♀. Following the live-trapping, a period of saturation snap-trapping was begun in the central 1-acre plot and continued for 35 nights. The first 3 nights resulted in the capture of 13 adult ♂♂, 10 adult ♀♀, and 3 juveniles. Thus, by standard snap-trap methods, the population would have been estimated at the erroneously high figure of 23 adult mice per acre. By the 35th night of continuous trapping a total of 36 adult ♂♂, 18 adult ♀♀ and 22 small juveniles had been taken. All of these adult animals were marked individuals that had been taken in the live-trapping period. The animals taken first in the central acre were those whose normal ranges overlapped or closely approached this area. After these were removed from the area the animals captured in the central acre were, in general, those whose normal ranges were at successively greater distances. Ingress was from all directions, principally by mice with previously established nearby home ranges, not merely vagrant animals.—*L. F. Stickel*.

8135. Wells, G. P. (*Univ. Coll., London, Eng.*) The water relations of snails and slugs. III. Factors determining activity in *Helix pomatia* L. *Jour. Exptl. Biol.* 20(2): 79-87. 4 fig. 1944.—This paper deals with the activity phases of snails leaving out the period of hibernation. If the snail, *H. pomatia*, is kept under constant conditions, there are large fluctuations in wt. In fed snails, O<sub>2</sub> consumption tends to rise with wt.; in fasted animals the O<sub>2</sub> consumption is always low. Aestivation tends to occur whenever the wt. is low. The snail remains withdrawn in times of drought, with low wt. and oxygen consumption. Rain has a stimulating effect.—*C. H. Beatty*.

8136. Yepes, J. Bases de la zoogeografía moderna. [The principles of modern zoogeography.] *Rev. Argentina Zoogeogr.* [Buenos Aires] 3(1/2): 21-31. 1943.—After discussion of the preparation of zoogeographic diagrams, the principles of zoogeography, as established in the last century, are noted and the point is made that the minor faunistic districts are poorly defined insofar as S. America is concerned. The current faunistic catalogues are little more than a preparation for future zoogeographic study. Article concludes with a brief discussion of ecology and taxonomy.—*J. A. Crespo*.

8137. Yepes, J. Localidades argentinas para el pudú chileno [Pudu pudu]. [Argentine localities of the Chilean pudú.] *Rev. Argentina Zoogeogr.* [Buenos Aires] 3(1/2): 75-76. 1943.—This species has a very limited distribution in the Argentine. The following localities are added, all of them in the Gobernación de Neuquén: Lago Lacar, Brazo Correntoso, and Lago Lolog. It is supposed that this species enters Argentina through damp and wooded passes in the Andes Mts.—*J. A. Crespo*.

8138. Yepes, J. Expansión del "mara" (*Dolichotis australis*) en la provincias centrales de Argentina. [Spread of the mara in the central provinces of Argentina.] *Rev. Argentina Zoogeogr.* [Buenos Aires] 3(3): 147-148. 1943.—New localities in the western part, and center of, the Catamarca Prov. are listed. These are the n.e. of Tinogasta (stony and sandy soils, with spots of brushwood) and s.e. of Andalgalá (scrub habitats). According to the author, this species extends only to 27° (S. lat.).—*J. A. Crespo*.

## PLANT

8139. Adam, R. M. (Roy. Bot. Gard., Edinburgh, Scotland.) Plant indicators of a local climate. *Scottish Geogr. Mag.* 62(1): 24-26. Map, 5 pl. 1946.—Provides details of climate in Wigtownshire to explain the ability of proprietors to grow exotic plants in the open which would fail to grow in most situations in Scotland. Among many others growing very successfully are *Cordylina australis*, *Chamaerops excelsa*, *Dicksonia antarctica*, *Drimys winteri*, *Echium pininana*, *Lobelia tupa*, *Chianthus puniceus* and *Calceolaria violacea*.—C. E. Foister.
8140. Allard, H. A. Shale barren associations on Massanutten Mountain, Virginia. *Castanea* 11(3): 71-124. 10 fig. 1946.—Study of a large natural area which, on account of its roughness and barrenness, is still in much the same condition that prevailed before civilization. In such an area the generic coeff., or proportion of genera to species found, is very high as compared with areas of great ecological diversity.—A. L. Pickens.
8141. Bacmeister, A. Beiträge zum allgemeinen ökologischen Begriffsapparat. [Contribution to the ecologic concept apparatus.] *Biol. Gen.* [Vienna] 16(4): 476-492. 1942.—The series of papers, of which the present one is the first, is intended to review the generally known concepts of ecology. This is done for the concepts of "condition" (Bedingung) and "environment" (Umwelt).—Max Onno.
8142. Báez, Juan Romuldo. Dos aspectos de la vegetación del Norte de San Luis. II. Con mención sobre forrajeras y malezas. [Two aspects of the vegetation of northern San Luis. II. With mention of forage plants and weeds.] *Rev. Argentina Agron.* 13(2): 69-95. 1946.—A detailed factual article on climate, dominant plants in various locations, epiphytes, soils, forage plants and weeds, and water analysis.—S. W. Edgecombe.
8143. Darimont, F. Un site biologique à protéger "La Heid des Gattes" près d'Aywaille. [A biological site to protect "La Heid des Gattes" near Aywaille.] *Bull. Soc. Roy. Bot. Belgique* 77: 7-13. 1945.
8144. DuVigneaud, P. Aperçu phytogéographique et phytosociologique des tourbières de l'Ardenne luxembourgeoise. [Note on the peat-bogs of the Ardenne of Luxembourg.] *Bull. Soc. Roy. Bot. Belgique* 76: 11-16. 1944.
8145. DuVigneaud, P. *Cuscuta epithymum* (L.) Mure et les bruyères de Belgique. [C. epithymum and the heaths of Belgium.] *Bull. Soc. Roy. Bot. Belgique* 77: 73-84. 1945.—The author gives a phytosociological table of a Calluneto-Antennarietum pruneto-genistetosum tinctoriae. He draws some conclusions upon the colonization of Devonian schist rocks. He considers this Calluneto as intermediary subcontinental.—Ray Bouillenne.
8146. DuVigneaud, P., C. Van den Berghen, et P. Heine-mann. Le marais de Bergh et sa flore. [The marsh of Bergh and its flora.] *Bull. Soc. Roy. Bot. Belgique* 74: 139-153. 1941-1942.
8147. Englund, Bengt. Die Pflanzenverteilung auf den Meeresufer von Gotland. *Acta Bot. Fennica* 32: 1-282. 165 maps, 5 fig. 1942.—An introductory geographical and geological survey of Gotland and its development during the postglacial period is given. The zones and limits of the seashore and different shore types are discussed. The distr. of the spp. is examined. The author distinguishes the following plant groups which are descr. in detail: rocky shore plants, 7 different groups of meadow-shore plants, sandy shore plants, fresh water plants, the *Tussilage-Equisetum arvense* group, the hemerophile group, the seaweed group and the anthropochore group. In a list of about 200 spp. information is given of the frequency, on a scale of 10 degrees, and the relation of spp. to some factors of great importance, viz., water, salt and fucoid manure, on a scale of 4 degrees.—W. Rosén.
8148. Fries, Nils. (U. Uppsala, Sweden.) Beobachtungen über die thamniscophage Mykorrhiza einiger Halophyten. *Bot. Notiser* 1944: 255-264. 3 fig. 1944.—Of 14 halophytes from the west coast of Sweden, 6 had thamniscophagous mycorrhiza. The formation and distribution of the mycorrhiza in the cortex were somewhat different in different species. The occurrence of mycorrhiza in *Aster tri-polium* at different habitats was examined. Only in 1 out of 10 cases was mycorrhiza lacking.—S. Algeus.
8149. Heath, Maurice E. (Soil Conserv. Serv., Ames, Iowa.) Soil depends upon grasses for protection. *Successful Farming* 44(11): 26-27, 63, 65. 8 maps, 8 fig. 1946.—Describes new vars. of grasses under test by Soil Conservation Service, and shows photograph and adaptation map of each.—Jim Roe.
8150. Hoffmann-Grobéty, Amélie. La tourbière de Bock-en, Canton de Glaris. Étude pollénanalytique et stratigraphique. [The Bocken Moor, Canton Glaris. A pollen-analytic and stratigraphic study.] *Ber. Geobot. Forschungsinst. Inst. Rübel Zürich* 1945: 11-41. 12 fig. 1946.—Contains a phytosociological description of the recent vegetation. In the center there is a high moor covered with stands of *Pinus uncinata* and *Betula pubescens*, depressions with *Carex limosa*, and *Sphagnum* hummocks. At the sides there are low moor stands chiefly covered with *Molinia caerulea* assoc. The postglacial forest history as studied by pollen analysis gave the following succession of forest ages: 1) *Pinus*, 2) *Corylus*, 3) mixed oak forest, 4) *Abies*, 5) *Abies-Picea*, 6) *Abies-Picea-Fagus*, 7) *Pinus uncinata*. The history of the moor itself was revealed by stratigraphic profiles. The pH value, within a profile, increased from 4.2 at the surface (*Sphagnum-Eriophorum* peat) to 7.96 at a depth of 8 meters (marl and pebbles).—Max Onno.
8152. Horn af Rantzien, Henning. (Riksmuseum, Stockholm, Sweden.) [The taxonomy, distribution and ecology of *Pleurospermum austriacum* (L.) Hoffm. emend. Turcz.] [In Swedish with Engl. summ.] *Svensk Bot. Tidskr.* 40(2): 179-213. 7 fig. 1946.—The paper gives the result of several yrs. investigation of this species, with reference to Swedish conditions. Within the section *Eu-Pleurospermum*, the Asiatic population (*P. uralense*) and the European one (*P. austriacum*) are subspecies, as there is a continuous series of morphological variations between them, their correct names being ssp. *eu-austriacum* Horn af R. and ssp. *uralense* (Hoffm.) Sommer. There are maps of the distribution in Europe and Asia and a special map as to the Swedish occurrences. The species has been reported from 22 Swedish localities in an area of about 200 km.<sup>2</sup> in the mountainous district of Kolmården in the eastern part of Central Sweden. The vegetation of these localities is briefly surveyed. The majority of them are in deciduous forests from which a secondary dispersion to other plant communities is postulated. From an ecological point of view, the Central European populations differ somewhat from the Swedish population. The former are said to be very exacting as regards shady habitats, humidity, Ca requirements and mechanical composition of the soil. Swedish *Pleurospermum* seems to be rather tolerant in respect to these factors, which is shown by analyses of the important habitat factors from several localities. A strange ecological feature of the Swedish population is that it is strikingly restricted to rivulet and stream gullies and to slopes facing north. The dispersion ecology of the species is discussed in detail. The circumstances of the immigration of the species into Sweden are uncertain. A previous theory that it immigrated during early Post-Glacial times is discussed and it is pointed out that the immigration was probably initiated at a much later date by the intentional or unintentional transport of the diaspores by human agency.—H. Horn af Rantzien.
8153. Kaserer, H. Der Einfluss des Fruchtbereiches auf die Entwicklung der Keimpflanzen. Zugleich ein Beitrag zur Frage der Synaptospermie. [Influence of fruit region upon development of seedlings, with a contribution on synaptospermie.] *Biol. Gen.* [Vienna] 18(3): 243-253. 2 fig. 1945.—Plant spp. germinating under unfavorable conditions, e.g., in alkaline, salt or arid soil, often have special means of securing a good development of the seedlings, such as persistence of pericarps and other floral organs with the seeds, which appendix organs may be provided with soil-unlocking (bodenaufschliessenden) substances as in the perianth of *Beta*, or with substances favoring germination, as in the glumes of Gramineae, or eventually act as a "threshold" for germination, i.e., postpone germination until precipitation is sufficient to secure not only germination but also seedling growth. As another such means is considered synaptospermie, the seeds remaining joined in groups until germination, with mutual chemical or mechanical help analogous to "group seeding" in agriculture.—Max Onno.
8154. Kuhnholz-Lordat, G., et F. Darimont. Esquisse



dynamique de la végétation du Thier de Nivella à la Montagne Saint-Pierre. *Lejeunia* 4: 46-51. 1940.—The authors give an evolutionary figure of the vegetation of this region.—*R. Bouillemne*.

8155. Lüdi, W. Pollenstatistische Untersuchung interglazialer gebänderter Mergel an der Rhone unterhalb Genf. [Pollen analysis studies on interglacial stratified marls of the Rhone below Geneva.] *Ber. Geobot. Forschungsinst. Rübel Zürich* 1945: 88-97. 1946.—The stratified marls of Cartigny and Chancy were studied by pollen analysis. In the Cartigny diagram *Picea* was dominant from bottom to top, exceeding 90% in the lower layers and decreasing a little towards the top, with a sharp decrease at the 42 cm. depth, caused by increase of *Pinus*, which occupies 2d place with a share of up to 34%. *Alnus* reached a max. in a horizon with frequent *Quercus* and *Corylus*. Finally, all woody pollens disappear except *Picea*, *Pinus* and *Betula*. The combination of *Picea*-*Pinus* pointed to the conclusion of a severe and rather continental climate and, as the marls are overlaid by moraine, they must have been sedimented during Riss-Wurm interglacial. The Chancy diagram showed a *Pinus* vegetation strongly associated with *Corylus*; *Alnus* and *Betula* occurring probably as bank growth. Chancy is evidently somewhat younger than Cartigny and both probably are to be dated from the time the glacial was probably at its retreat near Geneva.—*Max Onno*.

8156. Magrou, J. Sur la culture de quelques champignons de mycorrhizes à arbuscules et à vésicules. [In vitro culture of mycorrhizal fungi.] *Rev. Gén. Bot.* 53: 49-77. 1946.—*Phycomyces*-like fungi may be grown from the intracellular hyphal masses of rootlets of *Arum maculatum*, *Scilla bifolia*, *Orobancha tuberosus*; rootlets are washed repeatedly in sterile dist. water, then sectioned with a razor-blade while held firmly between 2 pieces of sterilized pith; free-hand sections are washed in sterile water, and the outer tissues are dissected away under the binocular microscope; the inner tissues are transplanted to a nutrient medium prepared from an aqueous extract of the soil from which roots had been collected, to which either aneurin or preferably peanut peptone hydrolyzate or yeast autolyzate is added; growth occurs only at relatively high pH, the optimum being 6.6. As contrasted with the above plants, *Veratrum album*, *Solanum dulcamara* and *S. tuberosum* contain in their roots intercellular hyphae, which can be readily made to grow into liquid media. Incidentally, Magrou confirms Reed and Fremont in that he observed the walls of mycorrhizal hyphae to yield a positive reaction for chitin.—*J. Dufrenoy*.

8157. Miller, M. F. Early measurements of runoff and erosion. *Soil Conserv. U. S. Dept. Agric.* 11(11): 255-257. 1946.

8158. Misra, R. (Benares U., India.) An ecological study of the vegetation of the Benares University grounds. *Jour. Indian Bot. Soc.* 25(2): 39-59. 1 pl., 1 fig. 1946.—The grounds of Benares Hindu Univ., covering an area of about 3 sq. miles, are described. The different factors controlling the vegetation in the 3 seasons were analyzed with a special study of the soil. It is concluded that the meadow vegetation, which is largely controlled by human activities, is a disclimax in this area.—*Auth. summ.*

8159. Ogilvie, A. G. (U. Edinburgh, Scotland.) Land reclamation in the Outer Isles. *Scottish Geogr. Mag.* 62(1): 26-28. 1946.—Briefly reviews the case for reclaiming shallow foreshores on some of the Scottish islands and for draining fresh-water lochs near the coast of the Long Island and Orkney.—*C. E. Foister*.

8160. Remane, A. Die Bedeutung der Lebensformtypen für die Oekologie. [Importance of life-form types for ecology.] *Biol. Gen. [Vienna]* 17(1/2): 164-182. 1943.—The author stresses the inadequacy of the various systems of life-forms for characterizing biotopes and suggests a combined system in which each sp. is to be considered as to nutrition, movement, reproduction, in plants also dissemination, etc., and to be expressed by a formula such as "E Ia, B IIb, C IIa" (nutrition class I group a, movement cl. III group b, reproduction class I group a). Examples are given from water habitats.—*Max Onno*.

8161. Rosenkranz, F. Oesterreich—eine Brücke zwischen Ost und West, auch in pflanzengeographischer Hinsicht. [Austria, a bridge between east and west, also from the phytogeographic point of view.] *Natur und Land* 33(1):

21-27. 1946.—Discusses the migration history of the flora of Austria, stressing its character as a link between Eastern and Western floral regions. The floristic elements of Lower Austria are grouped into 8 groups, constituting a specter fairly similar to that of Hungary: 1) European and Central European 43%, 2) Alpine 14%, 3) Mediterranean (incl. Atlantic-Mediterranean) 14%, 4) Continental 14%, 5) Cosmopolitan 6%, 6) s.-e. European (Balkan) 4%, 7) Atlantic 3%, 8) Boreal 2%.—*Max Onno*.

8162. Schnell, Raymond. La forêt montagnarde des massifs quartzitiques du Nimba et du Simandou (Guinée Française). *Bull. Soc. Bot. France* 92(7/8): 175-179. 3 fig. 1945.—This forest assumes 2 edaphic forms sharply differentiated, the tall forest of the humid river courses and the low forest of the declivities and rocky crests.—*E. L. Core*.

8163. Sternon, F. Esquisse Phytosociologique des terrains Bajociens et Toarcien de la Région Jurassique. *Lejeunia* 5: 77-114. 1941.—This study, based upon a geological survey of the country, shows the action of man upon vegetation (cultures) the phytosociological characteristics between Bajocien and Toarcien soils. It tries to form some conclusions upon the origins of the flora of this region.—*R. Bouillemne*.

8164. Wahlin, Bertil J. O. Vegetationen på Lilla Karlsö. I. *Bot. Notiser* 1945: 81-100. 1945.—Lilla Karlsö (Little Charles Island) is a small (1.5 km.<sup>2</sup>) island of calcareous rock, situated near Gotland in the Baltic Sea. The island was visited by Linnaeus in 1741 at his "Gothländska Resa" and has been repeatedly the object of botanical interest. Linnaeus here discovered *Lactuca quercina*, which in n. Europe is represented only here and in the adjacent Stora Karlsö. The species is now badly damaged by grazing cattle. On account of the heavy sheep pasturage the forests have been decimated. Only sparse bushes or small trees of *Fraxinus excelsior*, *Quercus robur*, *Sorbus suecica* and *Ulmus* sp. are found.—*H. Weimarck*.

8165. Anonymous. Grazing on Mt. Buffalo. *Victorian Nat.* 63(6): 135. 1946.—A protest to cattle men for destruction of native flora by grazing and burning.—*Olga Lakela*.

## OCEANOGRAPHY

(See also Entries 8119, 9647, 10175, 10548, 10558, 10560, 10601, 10916)

8166. Cowles, R. P. (Johns Hopkins U., Baltimore), and C. E. Brambel. (Mercy Hosp., Baltimore, Md.) The distribution of protozoa in the plankton of Chesapeake Bay and their relation to salinity. *Anat. Rec.* 96(4): 68. 1946.—An abstract.

8167. Ewing, Maurice, Allyn Vine, and J. L. Worzel. (Columbia U., N. Y. C.) Photography of the ocean bottom. *Jour. Optical Soc. Amer.* 36(6): 307-321. 18 fig. 1946.—The authors used a suspended camera and a free floating one, preferring the latter, except that it is hard to recover. One was lost on the 3d lowering after successful series at 2700 fathoms. A sail keeps the suspended camera from rotating. A trigger makes the exposure on contact with the bottom. The camera is in a watertight case with thick plate glass window. Details of the seal (rubber gaskets) and a formula for needed thickness are given. Large photo flash bulbs withstand the pressure at 60 fathoms; small ones, 650 fathoms. For greater depths, the lamps are enclosed in pyrex bells. Some incandescent lamps operated on 12-volt motor cycle storage batteries, lowered with them. Kodatron flash lamp had such high cable losses that its work was limited to 150 ft. Daylight is sufficient for even 100 ft. only on the brightest days. The free camera was actuated by clockwork for series exposures and returned to surface either by magnetic release of ballast or by slow soln. of a block of salt. For greatest depths successful floats were of glass or aluminum alloy, or of large cans or bags of gasoline. The suspended cameras took but one picture at a lowering. 5 illustrative photographs of the ocean bottom are printed.—*R. R. Newell*.

## WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 8014, 8550, 9088, 9097, 10372, 10573, 10586, 10587, 10726, 10739, 10741, 10743, 10745, 10746, 10747, 10752, 10753, 10756, 10760, 10761, 10762, 10763, 10764, 10765, 10766, 10767, 10770, 10772, 10775, 10777, 10778, 10779, 10781, 10783, 10806, 10834)

8168. Baughman, J. L. (Texas Game, Fish and Oyster Comm., Rockport.) An interesting association of fishes. *Copeia* 1946(4): 263. 1946.—An interesting association of marine and fresh water fishes was found in a canal near Barbour's Hill, Chambers County, Texas. 23 species were collected: *Ameiurus* sp., *Aphrododermus sayanus*, *Achirus facialis*, *Aploidonotus grunniens*, *Cynoscion* sp., *Cyprinus carpio*, *Chaenobryllus coronarius*, *Dormilator maculatus*, *Dorosoma cepedianum*, *Elops saurus*, *Huro salmoides*, *Ictiobus bubalis*, *Ictalurus furcatus*, *I. punctatus*, *Lepisosteus osseus leptorhynchus*, *L. playstomus*, *L. spatula*, *Lepomis cyanellus*, *L. macrochirus*, *Mugil cephalus*, *Micropogon undulatus*, *Morone interrupta*, *Pomoxis sparoides*. In addition numerous blue crabs, *Callinectes sapidus*, two large specimens of Troost's turtle (*Pseudemys scripta troosti*), and a diamond-backed water snake (*Natrix rhombifera rhombifera*) were collected. Sporadic notes have appeared on various occurrences of *Achirus*, *Micropogon*, *Cynoscion*, *Elops* and *Mugil* in fresh water, but nowhere was it possible to find notice of such a congregation of marine and fresh water species. No salinity test was made, but the water was fresh to the taste.—J. L. Baughman.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 8134, 10104, 10432, 10561, 10854, 10878, 10886, 10898, 10902, 10903, 10906, 10907, 10908, 10911, 10914, 10915, 10917, 10919, 10921, 10924, 10925, 10926, 10928)

8169. Dambach, Charles A. (Ohio State U., Columbus.) Some biological and economic aspects of field border management. *Trans. North Amer. Wildlife Conf.* 10: 169-184. 1945.—Crop field borders in Montgomery County, Ohio, were studied. Six types of borders (clean-tilled, herbaceous, sod, sod and shrub, shrub and osage orange hedge) were recognized. A minimum border width of 4 ft. is essential for operation of farm machinery. The value of land rendered untilable by the last 3 types of borders per 100 acre farm is \$33, \$137.50 and \$236.50, respectively. Fewer insects injurious to grain and forage crops occur in woody field borders than in sod or clean tilled borders. Orchard and truck crop insect pests are relatively more abundant in woody vegetation than in herbaceous growth. Populations of small mammals were 3-9 times more abundant in borders than in the adjacent crop fields. Sod type borders supported greater populations of injurious mammals than did the other types. Breeding and wintering birds were many times more abundant in borders than in crop fields. Breeding populations ranged from 25 to 33 pairs per border acre in shrub growth as compared to 0.4 to 6.9 pairs per border acre in bluegrass sod.—C. A. Dambach.

8170. Damon, David. Nebraska can have more quail hunting. *Outdoor Nebraska* 24(2): 16-19. 7 fig. 1946.—Study of weather data and quail populations indicates winter weather is a chief limiting factor for bobwhites in Nebraska. Suggestions for habitat improvement are given. It is concluded that quail hunting can be extended to at least 4 more counties in southeastern Nebraska through a sound quail management program.—L. L. Mohler.

8171. Darrow, Robert W. (New York State Conserv. Dept., Albany.) Relation of buffer species abundance to fox predation on grouse nests. *Trans. North Amer. Wildlife Conf.* 10: 270-273. 2 fig. 1945.—As cottontail rabbits and mice decreased in numbers, foxes spent increasingly more time hunting and ranged more widely. Grouse nests were apparently encountered primarily by chance. When low populations of buffers forced foxes to cover an area more intensively to obtain an adequate food supply, they consequently encountered and destroyed a greater proportion of the grouse nests present. An inverse relationship between buffer abundance and predation on game is thus indicated.—J. L. Seubert.

8172. Erickson, H. C. (U. S. Forest Serv., Washington, D. C.) Cooperative wildlife management on the Nautahala National Forest. *Wildlife in N. Carolina* 10(3): 6-7, 16-17. 3 fig. 1946.—Wildlife management on four areas totaling 90,000 acres, on the Nautahala National Forest, is administered through a cooperative agreement between the U. S. Forest Service and the N. Carolina Dept. of Conservation and Development. Objectives of this agreement are maintenance of adequate breeding stock, increase in wildlife carrying capacity of areas through environmental improve-

ment, maintenance of natural relationships between wildlife and vegetation, and protection and preservation of aesthetic values of both game and non-game wildlife. These objectives are to be obtained through intelligent restocking and use regulations.—L. E. Yeager.

8173. Hart, Dennis. (Dept. Conserv. and Develop., Raleigh, N. Carolina.) Sow—so that you may also reap. *Wildlife in N. Carolina* 10(1): 5, 16. 2 fig. 1946.—Quails, the most important game bird in N. Carolina, must have cover in proximity to food if species is to prosper. Early patch farming provided this condition, but intensive cultivation over large fields having few hedge rows or other cover does not. Modern farming, involving contouring, strip crops and field borders, is more favorable to game production as well as soil conservation.—L. E. Yeager.

8174. Hart, Dennis. (Dept. Conserv. and Develop., Raleigh, N. Carolina.) The fox-quail problem in North Carolina. *Wildlife in N. Carolina* 10(3): 13, 18. 1946.—Increase of foxes and decline of quails in recent yrs. is discussed. Growth in fox numbers is attributed to low fur prices and decline in fox hunting. Dogs, cats and other predators have increased in numbers during same period, and collectively predators have depressed quail populations. Extensive hunting is recommended as the best fox and stray dog and cat control. The findings of several biologists are cited in regard to fox foods, rabbits and mice being the most important in practically all cases.—L. E. Yeager.

8175. Hodgson, R. Beaver ways and habits. *Fur Trade Jour. Canada* 23(9): 14-15, 46, 48, 52. 1946.—A description of the habits of the beaver, its place in the early development of the U. S. and Canada, its food supply, dams, canals, and tree-felling abilities.—C. F. Bassett.

8176. Lincoln, Frederick C. (U. S. Fish and Wildlife Serv., Washington, D. C.) Flyway regulations. *Trans. North Amer. Wildlife Conf.* 10: 50-51. 1945.—Waterfowl management by flyways is complicated by administrative problems. The 4 recognized flyways comprise definite geographical regions and it has been clearly demonstrated by banding that each flyway has its own population of ducks and geese and that there is relatively little exchange between them. Breeding habits and hereditary influences hold "flyway crossbreeding" to a minimum. A species of waterfowl may be abundant in one flyway and greatly reduced in another. Separate regulations for each flyway would be the proper management technique but interstate jealousy would make administration very difficult.—John Oney, Jr.

8177. McCabe, Robert A. (U. Wisconsin Arboretum, Madison), and Arthur S. Hawkins. (Illinois Nat. Hist. Surv., Urbana.) The Hungarian partridge in Wisconsin. *Amer. Midland Nat.* 36(1): 1-75. 3 maps, 16 fig. 1946.—The ecology and life history of the Hungarian partridge (*Perdix perdix*) in Wisconsin were studied for 6 yrs. on a 50-sq. mi. tract in Jefferson Co. An attempt to manage (increase densities) the species failed. Causes of low densities were traced to the summer period by a climographic study. A comparison of nesting frequency and hay-mowing showed that hay-mowing during 6 years coincided with the peak of hatching. 435 nests were studied as to location, construction, egg laying, incubation, and success of hatching. A dummy nest study was made to illustrate types of egg predation. A key (with illustrations) to the age of embryos is worked out which describes the physical changes of the growing embryo. A similar key (without illustrations) is given for partridge chicks through 13 weeks old. Weight growth of several groups of pen-reared birds is compared. Secondary and tertiary sex ratios are compared. Photomicrographic material is used to sex birds as early as 7 days. Partridge pterylography is worked out. Results are given of behavior studies made with penned chicks and a winter food selection expt. carried on with 9 adult partridges.—R. A. McCabe.

8178. Machura, L. Naturschutz-heute? [Nature protection—today?] *Natur und Land* 33(1): 11-15. 1946.—Discusses exposing the present status and tasks of the nature protection movement in Austria, emphasizing that all traces of war in the landscape picture should be removed as soon as possible. Inasmuch as they touched threatened nature monuments, particular care is necessary to save the latter from destruction.—Max Onno.

8179. Mohler, Levi L. Tough assignments. *Outdoor Nebraska* 24(2): 4-8. 8 fig. 1946.—Popular account of

game research in Nebraska, including methods and results, with chief emphasis on upland game birds, deer and furbearers.—L. L. Mohler.

8180. Mohler, Levi L. What is a good deer gun? *Outdoor Nebraska* 24(3): 7-11. 2 fig. 1946.—Gun and shooting data were secured from 350 hunters in a special 1945 mule deer (*Odocoileus hemionus*) season in Nebraska National Forest. These included the type of gun used, length of shot, activity of deer when shot, and deadliness of various body shots. Apparently high velocity rifles are less efficient than other guns for killing deer.—L. L. Mohler.

8180A. Nefedov, N. I. (*Kafedra zoologii, Stalingrad. gosud. pedagog. Inst.*) Sel'skokhoziaistvennoe znachenie seroi kuropatki (*Perdix perdix* L.) v nizhnem Povolzh'e. [The agricultural rôle of the grey partridge (*Perdix perdix* Linne) in the lower Volga area.] *Zoologicheskii Zhurnal* 22(1): 41-43. 1943.—The contents of 66 crops and 5 stomachs of the gray partridge in the Stalingrad area consist of 35% of animal and 65% of vegetable food. 90% by wt. of the animal food consisted of injurious insects, e.g., *Pentatoma* sp., locusts, etc.—E. C. Dougherty.

8181. Nestler, Ralph B., Woodrow W. Bailey, and William D. Williams. Comparison of five major cereals in the maintenance diet of bobwhite quail. *Game Breeder and Sportsman* 49(4): 46-47. 1944.—518 bobwhite quail were used in expts. to determine the relative value of various cereals as a winter diet. With corn rated as 100 the others were classed as follows: wheat 77, mixed cereals 76, barley 75, rye 72, and oats 67. There was some picking with all diets except corn. Those birds on the oat diet were the worst offenders. The birds fed exclusively on oats also suffered from the cold.—J. R. Beer.

8182. Roberts, Austin. Breeding seasons for game birds. *S. African Jour. Sci.* 42: 172-173. 1946.—16 ducks and 11 partridges and francolins are noted as being summer or winter breeders, or both.—G. W. Sinclair.

8183. Salyer, J. Clark II. (*U. S. Fish and Wildlife Serv., Washington, D. C.*) The Carolina Beaver: a vanishing species? *Jour. Mammal.* 27(4): 331-335. 1946.—The Carolina beaver, until recently considered a vanishing species, has been successfully established on Fish and Wildlife Service refuge lands in Ga., Ala., Miss., and Tenn. Unusual food habits noted were the use of *Eupatorium* in summer by the beaver in Ga. and feeding on pine roots by the beaver in Miss. Bank dens were used extensively. Each of the colonies reported on, however, built the customary lodges and dams where circumstances permitted.—J. C. Salyer, II.

8184. Smith, Bertrand E. (*Moosehorn Nation. Wildlife Refuge, Calais, Me.*) Bear facts. *Jour. Mammal.* 27(1): 31-36. 1946.—Three newly born black bear cubs (*Eurarcos*

*americana*) found in a ground nest of *Myrica* and *Chamaedaphne calyculata* located beneath a spruce tree weighed a total of three pounds eight ounces. Growth and other data were obtained from 2 cubs reared.—B. E. Smith.

8185. Vogt, William. (*Pan Amer. Union, Washington, D. C.*) Unsolved problems concerning wildlife in Mexican national parks. *Trans. North Amer. Wildlife Conf.* 10: 355-358. 1945.—Mexico possesses 43 national parks and monuments. The writer visited 26. Wildlife in the suburbs of Washington or New York is more plentiful than in these. Mammals and game birds are rare; song birds extremely timid. The continuous hunting and destruction of environment is illegal. The one forest guard per park can not enforce the law without risking his life. Hunting parties are extremely large. Hunting is for food because of the bare subsistence level of living. No conservation education program exists. 12% of Mexico is arable land. In the past 15 yrs. the country's population has increased 30%. The plateau around Mexico City was once forested; now thousands of square miles are maguay-dominated desert. Because of increasing land destruction, the Mexican peasant constantly invades the remaining wild land. Wood is the only fuel available. Illegal cutting results on park lands. Overgrazing has reduced many to open park-like areas as on European estates. Great erosion problems result which the small Mexican soil conservation service cannot adequately handle. In the industrialization drive of 1944, the Mexican Congress changed the boundaries of the Colima National Park, excluding nearly the entire forested area which protected the water supply of the city of Colima. The timber is to be used for the manufacture of celanese in a plant financed by N. American capital. Poor relations will result between these 2 countries and Colima's water supply will probably be destroyed because of the desire for industrial profit. Only quick action can save these areas. Deforestation which will destroy wildlife habitat is an especially serious problem in Mexico because of the already diminished wildlife population. Unless land-use patterns are radically altered, most of Mexico will be virtually a desert within 100 yrs.—J. L. Dusi.

8187. Voogd, C. N. A. de. Richtlijnen voor een doeltreffende jachtregeling en natuurbescherming in Nederlandsch-Indie. [Suggestions for effective wildlife and nature protection in Netherlands East Indies.] *Tectona* 36(2): 41-58. 1946.—Creation of a permanent advisory council on game and nature protection and on administrative service under the Dept. for Economic Affairs is proposed. Some of the problems in need of early study and action are outlined. The principal nature reserves in Java have an area of 125,000 ha., and those in the other islands 1,112,000 ha.—W. N. Sparhawk.



# BIOLOGICAL ABSTRACTS

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## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*

(See also B. A. 21(4): Entries 7946, 8116, 9060, 9228, 9698; and in this issue 10961, 10976, 10978, 12352)

### TAXONOMY AND NOMENCLATURE

10929. Langeron, M., R. Ph. Dollfus, et G. Guillot. *Répertoire d'espèces et de genres nouveaux. Ann. Parasitol. Humaine et Comp.* 21(3/4): 208-224. 1946.—This valuable section of the *Annales*, recording new genera and spp. of parasites together with the publication references, and giving for each species the host and locality, is to be published again, after having been suspended since 1940. It is requested that authors who describe new parasites send copies of their publications addressed to *Direction des Annales de Parasitologie, 21, rue de l'École-de-Médecine, Paris (6°)*.—Harold Kirby.

### EXPLORATIONS, EXPEDITIONS, ETC.

10930. Travassos, Lauro. (*Inst. Oswaldo Cruz, Rio de Janeiro*.) Relatório da excursão do Instituto Oswaldo Cruz ao Rio Paraná (Porto Cabral), em marco e abril de 1944. [Report of the Instituto Oswaldo Cruz expedition to Rio Parana (Porto Cabral) in March and April, 1944.] *Mem. Inst. Oswaldo Cruz [Rio de Janeiro]* 42(1): 151-165. 1945.—208 mammals, birds, reptiles and fishes were autopsied and the internal parasites recovered are listed. 6,645 insects were collected. They are listed in the report.—M. A. Stewart.

### INSTITUTIONS, ADMINISTRATION

10931. Abbott, C. G. (*Smithsonian Inst., Washington, D. C.*) The Smithsonian in a world at war. *Sci. Month.* 63(5): 325-326. 1946.—The retired secretary of the Smithsonian Institution, on the occasion of its hundredth anniversary, opines that Smithsonian's purpose, "the increase and diffusion of knowledge among men," is for the good of men, and is inconsistent with an autocratic and centralized regime.—H. F. Copeland.

10932. Bok, Bart J. (*Harvard U., Cambridge, Mass.*) Science in UNESCO. *Sci. Month.* 63(5): 327-332. 1946.—The United Nations Educational, Scientific and Cultural Organization, planned at San Francisco and formulated at London in 1945, is now in existence by the formal adhesion of many nations including the U. S. (but not yet, regrettably, the Soviet Union). The Preparatory Commission under Julian Huxley, with the Natural Sciences Division under James Needham, is preparing for the first general meeting, to be held in Paris. The preliminary plans pertinent to science involve international exchange fellowships, and international commissions to give scientific advice to governments which may request it.—H. F. Copeland.

10933. Editorial. World Medical Association. *Brit. Med. Jour.* 1946(4474): 496. 1946.—Representatives of 31 countries attended the 3-day conference, Sept. 25-28, 1946, held at B.M.A. House, London. This editorial explains the 4 objectives of the new association, its expected relation to the World Health Organization (W.H.O.) and to the United Nations programs for UNESCO.

10934. Mulder, J. Sibinga. 's Lands Plantentuin te Buitenzorg, 1817-1942. [Royal Botanical Garden at Buitenzorg, 1817-1942.] *Landbouwk. Tijdschr.* 1942(664): 301-319. 13 fig. 1942.—History and description of the Botanical garden from its foundation until the war.—I. Rietsema.

10935. Anonymous. O Instituto Butantan. Histórico, organização e funcionamento. [The Butantan Institute. History, organization and functioning.] 15p. 9 fig. Instituto Butantan: São Paulo, 1946.—The Instituto Butantan was established in 1897, originally to house the horses needed for production of serum in an outbreak of bubonic plague. In a few yrs. it developed into an institute of human pathology, with various departments, responsible for the provision of biological products to the Health Dept. and other organizations. At present it has 6 buildings for laboratories and 7 for technical services, as well as numerous auxiliary buildings and dwellings of the personnel. The Institute has enlisted the volunteer service of many individuals all over the country who send in snakes in exchange for a supply of antivenom. The Institute sends out empty boxes and a special noose for catching the snakes. Up to the present, more than 350,000 ampoules of snake antivenom have been produced. The present rate is based on about 10,000 extractions of venom per yr., which means a quantity of about 2 liters. Many types of serum are produced, including bacterial antitoxins and vaccine against spotted fever.

### MISCELLANEOUS

10936. Bennett, H. H. (*Soil Conserv. Serv., Washington, D. C.*) Development of natural resources: The coming technological revolution on the land. *Science* 105(2714): 1-4. 1947.—Productive land is neither limitless nor inexhaustible. Its area is steadily shrinking because of erosion. Since society as a whole depends on the produce of the land for its present and future existence, society as a whole must share in the responsibility and cost of maintaining land in a productive state. Immediate action is imperative. Practical treatment must be based on the analysis of the character of the land and its needs. This is the principle underlying the new land technology developed in U.S.A. by the Soil Conservation Service.—H. M. Kaplan.

10937. Bray, A. Russian-English Scientific-Technical Dictionary. Internation. Univ. Press: New York, 1945.—This dictionary contains many terms used in physics, inorg. and org. chem., and engineering, but has practically none of those pertaining specifically to the biol. sciences.—D. L. Morris.

10938. Burcham, L. T. A "grass-counter" in the Pacific. *Sci. Month.* 64(1): 21-32. 7 fig. 1947.—Botanical field notes on Guadalcanal, Goodenough I., New Britain, Peleliu, Okinawa, and elsewhere.—H. F. Copeland.

10939. Ivy, A. C., and A. F. Zobel. Are animal experiments needed? *Jour. Amer. Pharm. Assoc. Pract. Pharm. Ed.* 7(9): 408-415. 1 fig. 1946.—A popular and informative article showing that animal experiments are not only needed to score victories in human diseases but necessary so that man may live. There would have been no insulin without dogs, no sulfonamides without the help of mice, rabbits, dogs and other animals before they were given to man. Penicillin, too, would be missing; and even the atomic bomb expts. needed animal expts. Anemia is no longer pernicious because of the expts. on dogs in 1925. The clue to the remedy of bleeding in jaundice was found in the chicken cages

of a Danish scientist in 1929. This is followed by authoritative statements by the Surgeon General of the U. S. Army, Thomas Parran of the U. S. Public Health Service, the Surgeon General of the Navy, et al.—*Greta Oppe*.

10940. Tate, Geoffrey M. (*Amer. Mus. Nat. Hist., N. Y. C.*) So you want to go exploring. *Nat. Hist. [New York]* 55(8): 356-359. 3 fig. 1946.—All the various phases of a natural scientific expedition are inter-related: destination depends on purpose, means and methods of traveling depend on destination, the equipment depends on purpose, costs depend on equipment, and the personnel depend on purpose and size of expeditions. Each party member must be a specialist in one or more lines, and proficient in several others, and at all times resourceful, versatile, and amiable. Necessary accessories are a multitudinous list of trade goods for the natives and a comprehensive medicine chest. The exacting requirements, mental and physical, are such that an expeditioner must be born to it if he would achieve eminence.—*G. H. Kelker*.

## EDUCATION

F. R. KILLE, *Editor*

(See also B. A. 21(4): in the section Apparatus and Technique; Visual Instruction in Microbiology, Immunology, and Public Health; and Entries 8906, 10104; and in this issue 11902, 11905)

### GENERAL

10943. Bode, I. T. Biology and conservation education, a contribution to the conservation program from the administrator's viewpoint. *Amer. Biol. Teacher* 9(3): 84-89. 1946.—Thinking in the field of management of wildlife resources is jumbled and unguided by science. Business turnover in this field runs to \$2,000,000,000 annually, and 30 million persons get hunting and fishing licenses each year. Biology teaching may be of 2 types: nature study (which loses all staying power with the teen-ager) and utilitarian biology. The latter, as far as wildlife conservation goes, is left to the layman. We need an educational program in this field based on sound scientific principles.—*E. T. Cox*.

10944. Caldwell, Otis W. Of what does good biology teaching consist? *Amer. Biol. Teacher* 9(2): 37-42. 1946.—One outstanding feature of each of 3 great biology teachers is described: Agassiz, a teacher of research; James G. Needham, a lab. teacher; and John M. Coulter, a lecturer. All obtained excellent results, although their methods were different.—*E. T. Cox*.

10945. Galbreath, J. W. (*Senior High Sch., East St. Louis, Ill.*) Teaching and learning aids in biology. *Amer. Biol. Teacher* 9(2): 45-47. 1946.—Most materials for teaching biology lie outside the textbook. Teaching and learning aids in biology are essential in developing the intellectual curiosity of the student. A bibliography on teaching aids described in the *Amer. Biol. Teacher* is included.—*E. T. Cox*.

10946. Hinton, Taylor. (*Amherst Coll., Amherst, Mass.*) Suggestions for laboratories in college courses in genetics. *Turtlox News* 25(1): 12-16. 1947.

10947. Lacroix, Donald S. (*Amherst High Sch., Mass.*) Displays and exhibits. *Amer. Biol. Teacher* 9(2): 43-45. 3 fig. 1946.—Various exhibits are suggested which can be placed in lab. with the assistance of students to add interest.—*E. T. Cox*.

10948. Larson, Enid A. (*Oroville Union High Sch., Calif.*) A dynamic approach to the study of conservation. *Amer. Biol. Teacher* 9(3): 69-72. 1 fig. 1946.—Since conservation requires co-operation of all the people, problems in this unit are studied by groups of 4-6 students. Each group presents its topic by plays, discussions, debates, trials, demonstrations, etc. Extra credit is given for information on local problems. Tests are devised to make students apply principles.—*E. T. Cox*.

10949. Miller, Dorothy C. (*Iowa State Teachers Coll., Cedar Falls, Iowa.*) Summer camp committee report. *Amer. Biol. Teacher* 9(1): 15-18. 1946.—The Natl. Assoc. of Biol. Teachers surveyed 100 camps in N.Y. and finds it impracticable to establish a summer camp. Since more and more schools are establishing camps, the report recommends the appointment of a committee to do five things: to draw up a philosophy of camping for NABT, to recommend desirable

10941. Van Aartsen, J. P. Consequences of the war on agriculture in the Netherlands. *Month. Bull. Agric. Sci. and Pract.* 37(3/4): 49S; (5/6): 70S. 1946.—Extensive data are given on land, field crops, horticulture, live stock and forestry, as to area, yield and quantities. Recovery of inundated land, costs of production, and scarcity of fertilizers and sprays are reported. Whereas formerly cereals were largely imported and prime animal and horticultural products exported, now the home market must be the farmers' chief concern. Greater purchasing power at home is expected from the export of industrial goods.—*R. O. Earl*.

10942. Walker, Egbert H. (*U. S. Nation. Herbarium, Washington, D. C.*) Biological collecting during World War II. *Sci. Month.* 63(5): 333-340. 1 fig. 1946.—The war gave to Americans in all services and ranks, while stationed in the Pacific, north or south, the opportunity to study nature and to collect. Despite hindrances and shortcomings at home and in the field, the yield in collections and in training has been high.—*H. F. Copeland*.

content, leadership, and procedures to existing camps, to provide a consulting service, to serve as a clearing house through which camp directors could get in touch with qualified teachers for nature counselors (biol. teachers have not usually proved to be good nature counselors), and to provide a camp nature specialist to help nature counselors set up programs.—*E. T. Cox*.

10950. Osborn, Fairfield. (*New York Zool. Soc., N. Y. C.*) The urgency of conservation education. *Amer. Biol. Teacher* 9(3): 72-75. 1946.—The two great threats to man today are misuse of atomic energy and continuing destruction of natural resources. Through science, man is a large scale geological force working havoc on our environment. The new science of conservation involves teaching the intimacy of man and his environment and the close interdependence of all living things. Biology teachers need "the form and spirit of the evangelist" to assist in this work, essential to human welfare and even to survival.—*E. T. Cox*.

10951. Packard, Charles E. (*Alfred U., N. Y.*) What biological facts interest high school sophomores? *Amer. Biol. Teacher* 9(2): 51-54. 1946.—Two high school biology classes were asked at midyear what had been of most interest. The replies, showing a very wide range of interest, are summarized fully and are analyzed in reference to the content of the course.—*F. R. Kille*.

10952. Packard, Chas. E. The topic of greatest importance in biology was—. *Amer. Biol. Teacher* 9(3): 75-78. 1946.—In order to lead students to think of the values of biology to individuals and society, they were asked what topic they considered of greatest value in the course. Results are summarized in a long table, and several replies are quoted directly. The results showed that secondary school students have well defined opinions and can support them.—*E. T. Cox*.

10953. Robertson, G. Gordon, and J. C. Haley. (*Baylor U. Coll. Med., Houston, Texas.*) Genetics in the medical curriculum. *Jour. Assoc. Amer. Med. Coll.* 21: 351-353. 1946.—Judging from their experience and from 60 opinions expressed in replies to questionnaires sent to deans of U.S. and Canadian medical schools, the authors believe: instruction in principles of genetics should be required in the premedical curriculum; lectures in medical genetics should be included in one of the preclinical courses; and when subjects with genetic implications are encountered in clinical courses, discussion of principles should be encouraged.—*F. R. Kille*.

10954. Root, Oscar M. (*Brooks Sch., North Andover, Mass.*) Doing in conservation. *Amer. Biol. Teacher* 9(2): 57-58. 1946.—Biology students wrote letters to their Congressmen and Senators and to the Chairman of the House Committee urging the passage of an anti-pollution bill that was coming up. The students also sought support from local and out-of-state groups. Such activity teaches students how to assist in the program of conservation.—*E. T. Cox*.

## BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 10929, 11143, 11236, 12340, 12352)

## HISTORY

10955. Codellas, Pan. S. The case of smallpox of Theodorus Prodromus (XIIth Cent. A.D.) *Bull. History Med.* 20(2): 207-215. 1946.—Several authors to the contrary notwithstanding, there is no evidence that the Greeks knew anything of smallpox. The statement in the classic treatise on Smallpox by Rhazes (c. 850-923/4) that Galen knew the disease, is not correct. There is no suspicion of smallpox being known to the Byzantines. In the compendious medical treatise of Theophanes Nonnus (Xth Cent.) there is no mention of anything resembling smallpox. Aaron of Alexandria (fl. 610-641) is reported the first medical writer to describe smallpox. Constantinus Africanus (1020-1087) is distinguished by his use of the word variola exclusively for smallpox. Smallpox and Mohammed appeared about the same time. It spread through new territories with the Moslem invasions. But it appears to have been excluded from the Byzantine Empire by strict guarding of its frontiers. Physicians of Constantinople had never heard of anything like the case of Theodore Prodromos. In letters to friends—translated excerpts are quoted in this article—he describes his symptoms day by day, and the after effects. Theodore was not a medical man. He was famous as an orator, poet, and writer of prose, a favorite at the Imperial Court. His description of the experiences that he survived is probably the earliest case of smallpox described in detail, with masterful strokes, by a European in a European language.—R. P. Bigelow.

10956. Corradetti, A. Pietro Paolo da Sangallo e le sue esperienze intorno alla generazione delle zanzare. [P. P. da Sangallo and his experiences in the breeding of mosquitoes.] *Riv. Parassitol.* 7(1): 1-6. 2 fig. 1943.—This is a commentary on a little book written by P. P. da Sangallo in 1679 in the form of a letter to Francesco Redi, where the author described quite exactly, and for the first time, all the developmental stages of mosquitoes, proving their development from the eggs, the existence of morphologically different races, and making some observations on the biology of the various stages under different physical conditions.—Gabriele Gramiccia.

10957. Judd, Neil M. (U. S. Nation. Mus., Washington, D. C.) The rising quality of New World archeology. *Sci. Month.* 63(5): 391-394. 1946.—Archeology has progressed in the Americas from a work of curious individuals, like Jefferson and Bartram, to a technical specialty, successful on the whole, though sometimes involving excessive speculation on petty detail.—H. F. Copeland.

10958. Kasich, Anthony M. William Prout and the discovery of hydrochloric acid in the gastric juice. *Bull. History Med.* 20(2): 340-358. 3 fig. 1946.—The production of HCl by a gastric gland is one of the most interesting phenomena of nature. While other tissues will not survive a variation of acidity greater than pH 7.1 to pH 7.7, the parietal cells make a substance whose acidity reaches pH 0.9 or less. The ancients knew that digestion consists in converting solid materials into something soluble. Later writers discussed the subject. But the first real advance was made in the 18th century by Réaumur, who fed to kites perforated metal tubes stuffed with sponges. When they were vomited he squeezed out the juice and found that it dissolved meat and bone and turned blue paper red. Spallanzani experimented with various animals and proved the chemical nature of digestion by showing it can take place in vitro. He submitted crow's gastric juice to Scopoli, chemist at Pavia, who found that "it precipitates silver from nitrous acid," the first gastric analysis on record. In his thesis for his M.D. at Univ. of Pennsylvania (1803), John R. Young described expts. on frogs and on himself, proving that the acid in stomachs of animals and man is to be referred to the gastric juice. From chemical tests he inferred that the acid was phosphoric, thus missing the great discovery. William Prout (1785-1850), a pupil of T. C. Hope in chemistry and of A. Duncan in physiology at Edinburgh, settled in London and worked in hospitals and at private practice but was interested

chiefly in chemistry, becoming the foremost chemist in England. In 1823 he read before the Royal Society his classic paper (*Phil. Trans.* 114: 44-49. 1824) describing in detail a carefully planned series of expts. proving conclusively that the acid in the gastric juice is HCl. His conclusion was not immediately accepted, although it was confirmed in part by Tiedemann and Gmelin (1826) and by Beaumont (1833), who had sent samples of St. Martin's gastric juice to Dunglison and Emmett at Univ. of Virginia and to Silliman at Yale, all of whom reported the acid to be HCl. Earlier and later episodes of Prout's life are described, including his controversy with W. Philip on vitalism. Final confirmation of his theory was made by Bidder and Schmidt (1852), 2 years after his death.—R. P. Bigelow.

10958A. Monteiro, Arlindo Camilo. Les doctrines médicales de William Cullen et de John Brown en Portugal et en Espagne. 72p. + XXXIII illus. Grupo Português da História das Ciências: Lisbon, 1937.—William Cullen (1712-1790) and John Brown (1735-1788), two English physicians, had each a basic system which explained the origin and cause of disease, and hence, also a therapeutic system of restoring and preserving health. Cullen founded physiology and pathology upon a nerve fluid, analogous to the ether of Newton, which determined sickness and health. He combatted the excessive medication in vogue in his time. Brown taught that a force labeled "incitability", which reacted to such exterior stimulants as air, light and food, and to interior incitants, such as blood, body fluids, muscular movements, thoughts and passions, formed a subtraction to life itself, and thus its state was the prime cause of health and disease. The works of both men were widely translated and the influence of both doctrines was widespread. The author traces the spread of their doctrines in the Iberian Peninsula through the activities of the translators and disciples of the 2 Englishmen.—Conway Zirkle.

10959. Mullett, Charles F. The bubonic plague in England: A problem in public health. *Bull. History Med.* 20(2): 299-309. 1946.—Historians have attached great importance to the London plague of 1665 and to the tragic Black Death of 1348-52, but have failed to realize that in nearly each of the yrs. 1348-1665 some community suffered and on several occasions a considerable region was devastated. Moreover, for nearly a century later the threat from neighboring countries inspired legislation and medical description. Testimony of these epidemics and their consequences has survived for many and diverse areas. The present paper is a plea for special attention to this history. The plague, because of its powerful impact, is an ideal medium for epidemiological study.—R. P. Bigelow.

10960. Riese, W. The 150th anniversary of S. T. Soemmerring's Organ of the Soul. *Bull. History Med.* 20(2): 310-321. 1 fig. 1946.—The work "Über das Organ der Seele" (1796) was written while Soemmerring was teaching anatomy and physiology at Mainz. It is notable for presenting the first correct picture of a sagittal section of the brain showing the mesial aspect of the hemispheres. The book may be divided into 2 parts. Appealing to descriptive, developmental, and comparative neurology, Soemmerring tried to prove 1) that the walls of the cerebral cavities receive the endings of the nerves and 2) that the fluid in these cavities must be considered as the sensorium commune. The publication provoked a sensation, much criticism, and open opposition. What is important is the reaction produced in Hildebrandt and the 2 philosophers, Goethe and Kant, and its significance today. These topics are discussed at length.—R. P. Bigelow.

10961. Rosen, George. The philosophy of Ideology and the emergence of modern medicine in France. *Bull. History Med.* 20(2): 323-339. 1946.—The philosophy known as Ideology achieved its most characteristic expression during the French Revolution. The Idéologues were a group of French thinkers of the revolutionary and post-revolutionary periods who developed and systematized the ideas outlined by the Abbé Etienne de Condillac during the 18th century.



The rôle of Ideology and its proponents in laying the foundations and providing the theoretical underpinning for the achievements of the French clinical school is discussed. The attempt is to sketch the main outlines of the problem and to indicate some avenues for future research.—*R. P. Biegelow.*

10962. Temkin, Owsei. (*Johns Hopkins U., Baltimore, Md.*) Materialism in French and German physiology of the early nineteenth century. *Bull. History Med.* 20(2): 322-327. 1946.—Around 1800, French physiologists elaborated a doctrine which stood in contrast to the beliefs of their philosopher Descartes. This vitalistic materialism is compared with the materialism of a different pattern as developed by the German physiologists from 1838 onward. By 1848 some German physiologists had advanced to a position that recognized only matter and force.—*R. P. Biegelow.*

10963. Van Ooststroom, S. J. On an 18th century oil-painting of botanical interest. *Blumea Suppl.* 3 (Dr. J. Th. Henrard Jubilee vol.): 120-121. 1946.—A reproduction in black and white is given of a painting showing a peculiar grouping of exotic flowering plants, one fern, and some small mushrooms which is owned by the Leyden Univ. Fund. The painter was in doubt but study of other drawings points to Laurens van der Vinne, the younger, who died in 1742. A list of identifications of the plants is added.—*Agnes Chase.*

### BIBLIOGRAPHY

10964. Remington, Charles L. (*Harvard U., Cambridge, Mass.*) The effects of the war on Japanese entomological publications. *Ann. Ent. Soc. America* 39(3): 510-512. 1946.—All Japanese entomological periodicals were discontinued during the War. The 9 periodicals entirely on entomology and the 6 principal serial publications containing papers on insects as well as other groups are listed, with the place of publication, volumes published, and last issue published before discontinuance given for each one. Two of the 9 strictly entomological periodicals are entirely in foreign languages, 3 contain papers in both Japanese and foreign languages, and the 4 lesser journals are entirely in Japanese. None of the former periodicals has been able to resume publication, but a new journal has appeared and another will soon be published. A large backlog of research papers has accumulated, awaiting resumption of publications. A few books appeared on a poor grade of paper during the war. Several beautifully illustrated books on entomology are ready for publication.—*C. L. Remington.*

### BIOGRAPHY

10965. C. T. W. Dr. Eugen Hirschfeld. An appreciation. *Queensland Agric. Jour.* 63(2): 117-118. 1 fig. 1946.—Born Jan. 22, 1866, at Breslau, Germany; died June 18, 1946, at Byberrra, Darling Downs, Queensland. Dr. Hirschfeld went to Australia in 1893. He served at Univ. Queensland and in the Queensland Parliament. He wrote many papers on preventive medicine, in particular tuberculosis, and a classic description of dengue fever. He is known for pasture research and for development of the drought-resistant brigalow and belah country.—*T. L. Bissell.*

10966. Fawcett, Howard S. Peter Henry Rolfs (1865-1944). *Bol. Soc. Brasileira Agron.* 8(4): 359-366. Portrait. 1945.—This obituary notice, here printed in Portuguese translation, traces the career of a pioneer American phytopathologist with broad interests in horticulture and in other fields. Director of the Florida Agric. Expt. Station from 1906 and Dean of the College of Agric. from 1915 to 1921, when, at the invitation of the Brazilian government, he organized the Escola Superior de Agricultura at Vicosa, Minas Gerais, and remained its head until his retirement in 1933. He died on Feb. 23, 1944, at Gainesville, Florida. A list of his publications is appended.—*J. L. Cartledge.*

10967. Gibson, J. E. Benjamin Rush's apprenticed students. *Trans. and Stud. Coll. Phys. Philadelphia* 14(3): 127-132. 1946.—Alphabetic and geographic lists of Rush's apprenticed students, as found in a Rush manuscript notebook in the Ridgeway Library, Phila., preceded by comment on some of the students named and on Rush's influence on his students.—*W. B. McDaniel, 2d.*

10968. Goddijn, W. A. Dr. Jan Theodoor Henrard. *Blumea Suppl.* 3 (Dr. J. Th. Henrard Jubilee vol.): 4-9. Portrait. 1946.—A biographical sketch of Dr. Henrard, to whom this issue of *Blumea* is dedicated, with a dedicatory

letter from Dr. H. J. Lam. Henrard was born at Maastricht, Limburg, Netherlands, Oct. 16, 1881, and in 1946 reached the age of retirement. From 1916 he has been a member of the staff of the Rijksherbarium, Leiden, and from 1921 the conservator of this herbarium. His publications, especially on the taxonomy of grasses, have made him favorably known throughout the botanical world. A bibliography of 69 titles, compiled by H. J. van der Hee, is added.—*Agnes Chase.*

10969. Obituary. Henning E. Petersen. August 22, 1877-May 22, 1946. *Bot. Tidsskr.* 48(1): 122-126. Portrait. Also in: *Univ. Festschrift* 1946: 138-142. Portrait. 1946.—Danish botanist at the Univ. of Copenhagen (Denmark). Studied especially Phycomycetes, *Ceramium*, *Enteromorpha*, and, in addition, the polymorphism of the higher plants and the anatomy and *Ophiobolus* diseases in *Zostera*.—*J. B. Hansen.*

10970. Pepper, O. H. P. (*U. Pennsylvania Hosp., Philadelphia.*) Benjamin Rush's theories on blood letting after one hundred and fifty years. *Trans. and Stud. Coll. Phys. Philadelphia* 14(3): 121-126. 1946.—Historical evidence testifies to the large amts. of blood removed by Rush, especially from patients with yellow fever—"should it be until four-fifths of the blood contained in the body are drained away." The criteria used by Rush in determining the need of blood letting included the state of the pulse and the appearance of the blood in the bleeding bowl. In the latter, it was an increase of the buffy coat of 'size' which indicated further bleeding. Rush did not know that the degree of sizyness depends on the sedimentation rate and that this is rapid in many conditions including pregnancy, all infections and anemia itself. Every bleeding increased the anemia and so increased the indication for further bleeding. This knowledge was not applied in medicine until over 100 yrs. later. The indications for bleeding today are very different from the old view accepted by Rush that by bleeding one removed the materia morificans which was the buffy coat. Recently the same reasoning has been introduced in exsanguination-transfusion in which even more blood is removed but simultaneously replaced. The wonder is that so many of Rush's patients did survive and apparently they did.—*O. H. P. Pepper.*

10971. Shaw, Margaret Mason. He conquered death. The story of Frederick Grant Banting. 111p. Portrait, 10 fig. Macmillan Co.: Toronto, Canada, 1946. Pr. \$1.80.—A brief, intimate account of Banting's life and work based chiefly upon data supplied by his family and friends. It covers the period from B.'s college days until his death (1912-1941) and mentions all the principal episodes and phases of his life. Some less familiar aspects are noted. After his death over 200 of his paintings and some of his wood carvings were exhibited. He loved camping, travelled quite extensively (Spain, Russia, the Arctic, S. America, etc.) and had a large circle of friends and grateful patients.

10972. Shryock, Richard H. Benjamin Rush in the perspective of the Twentieth Century. *Trans. and Stud. Coll. Phys. Philadelphia* 14(3): 113-120. 1946.—Rush, the best known American physician in 1800, has been the subject of sharply contrasting professional opinions from 1790 until the present time. A reexamination of his published works and of much of his unpublished lectures and correspondence makes possible an analysis of his basic medical "system" which featured a monistic pathology of vascular hypertension and a single therapeutic procedure (depletion by bleeding and purging) deduced therefrom. This system seems to have been based on 1) a slight amt. of clinical evidence, 2) a confusion of cause and effect relationships in that connection, 3) an effort to clarify current confusion in nosography, and 4) the old speculative tradition of a tension pathology. Unfortunately, Rush's theories discouraged real pathologic research, since they claimed to present final explanations. While Rush's theory of disease unity was reactionary, and his treatments extreme, he had the merit of viewing the patient as a whole. Modern medicine has returned to his interest in psychosomatic relationships, and modern scientists share his view that the scientist should participate in public affairs. A uniquely popular teacher, Rush probably did more than any other one man to make Philadelphia a national medical center.—*R. H. Shryock.*

10973. Sturtevant, A. H. Thomas Hunt Morgan. *Genetics* 32(1): 1-2. Portrait. 1947.—An appreciation and general review.

10974. Webb, Gerald B., and Desmond Powell. Henry Sewall. Physiologist and physician. [With foreword by the authors.] 191p. Frontispiece, 14 pl. Johns Hopkins Press. Baltimore, 1946. Pr. \$2.75.—Henry Sewall (1855-1936) may be known to some only by his writings (Bibliography of 155 titles) but to others he is still a vivid, influential personality. In his teaching and laboratory work at Johns Hopkins (1876-'82), U. Michigan (1882-'89) Denver and Cross Coll. Med. (1890-'08) and U. Colorado (1911-'17) he was a beloved, intimate friend of his colleagues and an inspiration to many students. Memorial tablets at the U. Mich., U. Colorado and letters found among his papers show the deep impression he made on all with whom he came in contact. The move to Colorado was forced by his fight to overcome tuberculosis. That he lived to be 81 testifies to his winning battle. His illness accounts for the many papers on tuberculosis and his successful efforts to promote the Natl. Tuberc. Assoc. At Johns Hopkins, including a year abroad, and at U. Michigan, physiology and research occupied his time.

In England and Germany he established life-long friendships with Sir Michael Foster, Carl Ludwig and W. Kühne, and at Baltimore with Newell Martin, Howell, Welch et al. The plaque at the U. Mich. commemorates his snake venom expts. and pioneer work demonstrating the principle of antitoxin production. When he went to Colorado he completed the requirements in 1889 for an M.D. degree for which he had unofficially been preparing for many years. In 1891 he started practicing as a physician and was appointed Professor of Medicine at the U. Colorado. He also received an honorary M.D. from the U. Mich., an unusual honor. All his life, but especially in his late 60's and early 70's, Sewall kept in touch with friends by letter. Dr. Webb who writes this biography corresponded with him over 40 yrs. He states "There is abundant evidence that Sewall served as a catalytic agent to all his confrères, professional and non-professional." Written by warm admirers this little biography presents many interesting details of a life rich in experience and accomplishment.

## EVOLUTION

ALFRED EMERSON, *Editor*

(See also: Production of saltant in fungus by visible and long wave u.-v. radiation, 11018; Role of gene mutation in evolution, 11066; Kinship and distr. of organisms, 11203; Races of *Motacilla* (Aves), 13173; Selection in birds in range expansion, 13187; Monotremes, 13214)

10975. Gregory, William K. The roles of motile larvae and fixed adults in the origin of the vertebrates. *Quart. Rev. Biol.* 21(4): 348-364. 1946.—The eclectic theory herein developed sets forth the following observations: that notwithstanding wide diversification of adult forms among echinoderms into sessile, stalked, and slow-moving animals, all developed free-floating larvae, which scatter widely enough to insure favorable sites for a sufficient percentage of the adult reproductive phase. That among tunicates the larvae may have utilized the ancient stalk as a vibratile tail, but with a minimum of directive organs in the central nervous system. That *Amphioxus*, although possibly degenerate, represents a much higher stage than the echinoderms. In slow-moving ostracoderms such as *Drepanaspis* and *Cephalaspis*, larval locomotor stages are still unknown, but in the modern lampreys, which appear to be degenerate derivatives of the ostracoderms, the locomotive larval stages are truly jawless and retain resemblances to the orobranchial system of *Cephalaspis*, while the nasopituitary sac shows how, by great increase in size of the "upper lip" behind the pituitary sac, the latter became displaced to the top of the skull. Thus both fixed adults and motile larvae may have played important roles in the origin of the vertebrates from such attached enteroblastic forms as the earliest carpoid echinoderms. The metameric locomotor system was developed in the motile larvae before the fixed stage was eliminated by neotony.—*Alfred Brauer.*

10976. Haas, Otto (*Amer. Mus. Nat. Hist.*, N. Y. C.), and George G. Simpson. (*Columbia U.*, N. Y. C.) Analysis of some phylogenetic terms, with attempts at redefinition. *Proc. Amer. Phil. Soc.* 90(5): 319-347. 1946.—The terms homology (homogeny), analogy, convergence, divergence, homoplasy, parallelism, homeomorphy, time signatures, homeomorphic recurrence, and iteration are traced back to their origins and critically analyzed. The following conclusions are reached:—Owen's (special) homology should be restricted to similarities between parts, organs, or structures of different organisms attributable to common ancestry; homogeny (Lankester) then becomes a synonym of homology. Homoplasy (Lankester) brings about similarities between organisms or their parts, organs, or structures, due not to common ancestry, but to independent acquisition of the similar characters. Even where this independent acquisition may be attributed to some latent or potential predisposition inherited by both or all lines concerned from a common ancestor (Osborn's latent or potential homology), the similarities should be considered homoplastic but not homologous. Heterology (Cope), homeomorphy (Palmén), isomorphy or isomorphism (Parker), homeogenesis (Eimer), and morphological equivalents (Hyatt) are considered synonyms, analogous variations (Darwin) and independent homologies

(Hubbs) are considered special cases of homoplasy. Other special cases of homoplasy are convergence and parallelism, distinction between which should be based on whether or not similarity increases with evolution rather than on degree of relationship between the lines involved. Convergence may lead to homeomorphy. The latter term ought to be restricted to similarities involving the whole outer appearance of the homeomorphs and reaching such a degree that the one might be mistaken for the other even by a trained naturalist unless certain internal or obscure characters are examined. Homeomorphy is not equivalent to nor does it include mimicry, but the 2 concepts overlap. Neither homoplasy, nor parallelism, nor convergence and homeomorphy implies anything as to contemporaneity of the similar changes; all these phenomena may be heterochronous or isochronous. Isochronous convergence and homeomorphy may, taxonomically, lead to polyphyletic morphologic genera and even higher units. Dacqué's terms "Zeitformenbildung" and "Zeitbaustile" are rejected; his "Zeitsignaturen" (time signatures) are admitted as a descriptive, not an explanatory, term to designate certain cases of isochronous parallelism or convergence. Recurrence of morphologic types may be merely homeomorphic recurrence or attributable to Koken's "iterative Artenbildung" (iterative formation of species—Beurle's iteration). In addition to the terms mentioned above, many others are discussed or mentioned. All phylogenetic terms are indexed.—*Auth. abst.*

10977. Mahabale, T. S. (*Gujarat Coll.*, Ahmedabad, India.) The concept of vestigial organs and the vascular cryptogams. *Current Sci.* 15(8): 220-225. 1946.—Vestigial organs are present throughout the plant kingdom though less abundant than in animals. The author reviews 4 main types in the vascular cryptogams: (1) the embryonic organs, later vestigial; (2) rudimentary organs exceptionally functional; (3) arrested organs; (4) internal vestigial tissue. Examples from main groups of the pteridophytes are discussed in terms of evidence from Devonian floras, comparative developmental anatomy, and studies of mutation and natural selection.—*S. W. Brown.*

10978. Nowikoff, M. Das Studium der Homomorphien als eine wissenschaftliche Methode. [Study of homomorphies as a scientific method.] *Biol. Gen.* [Vienna] 14: 85-110. 1939.—The term "homomorphy" is introduced for conformities not due to phylogenetic connection (which would be homologies) but is an expression of strictly orderly processes and is thus different from analogies, isomorphies, and homologies, which occur secondarily by the influence of causal factors. Homomorphies, in this sense, can be found in the animal and plant kingdoms, among crystals and elements, and even among manifestations of human activity (history, archeology, phonology).—*Max Onno.*

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 11008, 11015, 11024, 11028, 11029, 11035, 11040, 11044, 11048, 11061, 11108, 11112, 11114, 11115, 11116, 11287, 11289, 11295, 11357, 11373, 11436, 11603, 11659, 11751, 11765, 11766, 12042, 12324, 12332, 12363, 12364, 12576, 12592, 12975)

## GENERAL

10979. Carlson, J. Gordon, and Alexander Hollaender. (*Nation. Inst. Health, Bethesda, Md.*) Immediate mitotic effects of ultraviolet radiation of wavelength 2180 Å. *Anat. Rec.* 96(4): 39. 1946.—An abstract.

10980. Lorz, A. P. (*Purdue U., Lafayette, Ind.*) Heterocyclicity or polysomaty? *Jour. Heredity* 37(10): 297, 306. 1 fig. 1946.—The author suggests an alternative interpretation of Prokofieva-Belgovskaja's findings (*Jour. Heredity* Aug., 1946). It is suggested that the binucleate cells discussed are merely manifestations of amitoses associated with differentiation into permanent tissues with degenerative changes which culminate in the death of the cell. In a figure reproduced from Prokofieva's Fig. 12, the author has encircled sectors where a paired association of the chromosomes is manifest, which he considers to be evidence of polysomatic origin.—*L. M. Dickerson.*

## PLANT

10981. Brown, W. V. (*Brown U., Providence, R. I.*) Cytological studies in the Alismaceae. *Bot. Gaz.* 108(2): 262-267. 1 fig. 1946.—Chromosome numbers of 15 spp. of *Sagittaria* and 2 spp. of *Alisma* were detd. from acetocarmine smears of root tips. All spp. of *Sagittaria* have  $2n = 22$  and the idiograms of all spp. are the same except for possible variations in the lengths of particular chromosomes. The longest pair and the shortest pair of chromosomes have median constrictions. The remaining 9 pairs have subterminal constrictions. *A. triviale* is diploid with  $2n = 14$ , *A. subcordatum* is tetraploid. The idiogram for *A. triviale* consists of 5 pairs of chromosomes with median constrictions and 2 pairs with subterminal constrictions. *A. subcordatum* has an idiogram exactly double that of *A. triviale*.—*W. V. Brown.*

10982. Cummings, Jean M. (*Smith Coll., Northampton, Mass.*) Chromosomes of *Datura ceratocaula* in hybrids obtained by embryo dissection, an advance report. *Genetics* 32(1): 84. 1947.—An abstract.

10983. Fardy, A., et H. Hitier. (*Inst. Expil. Tabacs, Bergesa, Dordogne, France.*) Etude de l'action comparée de la colchicine et la nicotine sur les jeunes méristemes d'*Allium cepa*. [Action of colchicine and of nicotine on root tips of *A. cepa*.] *Mem. Serv. Exploitation Indust. Tabacs et Allumettes* 1B(2): 121-127. 2 pl. 1945.—Nicotine, at conc.  $< 0.1\%$ , is not toxic; at 0.2-0.4% it inhibits mitosis; at 0.5% it causes complete disintegration of chromatin.—*J. Dufrenoy.*

10984. Knaysi, Georges. (*Cornell U., Ithaca, N. Y.*) On the inclusions of *Hansenula anomala*. *Jour. Bact.* 52(4): 487-488. 1946.—Observations were made on the inclusions of *H. anomala* grown in dist. water, 0.2%  $(\text{NH}_4)_2\text{SO}_4$  and 0.2% glucose. The results indicated that this yeast utilized volutin as a source of N. In the absence of nutrients, volutin-free cells grown aerobically utilized the lipid inclusions as a source of energy and N. Under certain conditions, one type of inclusion was transformed to the other. They appeared to be by-products of normal metabolic processes of growth.—*M. M. Sigel.*

10985. Krug, C. A. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Citrus. IV. Número de cromossomos na sub-família Aurantioideae com referência especial ao gênero Citrus. [Cytological observations in Citrus. IV. Number of chromosomes in the sub-family Aurantioideae with special reference to the genus Citrus.] *Bragantia* 4(7): 413-428. 1944.—Translation, with small alterations, of an article [see B.A. 17(8): entry 19455].—*A. Grossmann.*

10986. Naidu, M. B., and V. M. Bakshi. (*Osmania Med. Coll., Hyderabad, India.*) The cytology of yeast. *Current Sci.* 15(8): 231. 3 fig. 1946.—After Bouin's soln., *Saccharomyces cerevisiae* is shown to have 12 chromosomes. Two additional bodies, presumably centrioles, appeared after staining with toluidine blue. Feulgen's reagent gave inconclusive results.—*S. W. Brown.*

10987. Nybom, Nils. Note on a case of sticky chromosomes and cytotoxicity. *Bot. Notiser* 1946(1): 122-124. 3 fig. 1946.—A brief report on a preliminary investigation of mitosis and especially meiosis in tetraploid *Primula malacoides* suffering from the unfavorable environment of living-room conditions. While premeiotic mitosis was normal, meiosis in pollen mother-cells showed interesting abnormalities at different stages including sticky bridges between chromosome masses and other indications of degeneration.—*H. L. Blomquist.*

10988. Pantulu, J. V. (*Andhra Christian Coll., Guntur, India.*) Chromosome number of *Cassia fistula*. *Current Sci.* 15(9): 255. 1 fig. 1946.—The no. in this sp. is  $2n = 28$ , at variance with that originally reported by Tischler, but in conformity with the numbers reported from most of the sub-genera.—*S. W. Brown.*

10989. Parthasarathy, N. (*Sugarcane Sta., Coimbatore, India.*) Chromosome numbers in Bambuseae. *Current Sci.* 15(8): 233-234. 6 fig. 1946.—Contrary to the published reports of  $2n = 72$ , *Dendrocalamus strictus* has the chromosome number  $2n = 70$ .—*S. W. Brown.*

10990. Sax, Karl. (*Harvard U., Cambridge, Mass.*) Temperature effects on X-ray-induced chromosome aberrations. *Genetics* 32(1): 75-78. 1947.—The frequency of ring and dicentric chromosomes was more than doubled when *Tradescantia* microspores were irradiated at  $3^\circ\text{C}$  compared with the same X-ray dosage at  $36^\circ\text{C}$ . Temp. differences had little or no effect on the frequency of rod deletions. The subsection of microspores to high and low temps. before or after irradiation produced no consistent differences in X-ray-induced aberrations.—*Karl Sax.*

10991. Stewart, R. N. (*Columbia U., N. Y. C.*) The morphology of somatic chromosomes in *Lilium*. *Amer. Jour. Bot.* 34(1): 9-26. 54 fig. 1947.—The karyotypes of 48 spp. and vars. of *Lilium* have been detd. including classification of all constrictions and analysis of nucleolar activity. Position, activity, and number of secondary constrictions were found to be the most variable features of the karyotypes of *Lilium* spp. Failure of normally nucleolar secondary constrictions to form nucleoli was found to be a cause, along with nucleolar fusion, of the frequent reduction from the maximum in the number of nucleoli in resting cells. The max. number of nucleoli in *Lilium* spp. varied from 4 to 14 and was in all cases equal to the max. number of chromosomes observed associated with nucleoli at secondary constrictions in pro-phases. In all but one sp. of  $> 40$  examined, there were additional secondary constrictions which were non-nucleolar. Variation in position of secondary constrictions was found to be correlated with type of chromatin distribution and geographical distribution. The differences between the karyotypes of the spp. were small but allowed an ordered arrangement into groups. These groups are considered natural because they can also be made on the basis of geographical distr., interspecific fertility and sterility, bulb structure, and growth responses to cultural conditions. The present classification provides entirely different groupings and revision is indicated. While chromosome morphology has indicated natural groups within the genus *Lilium*, its usefulness in indicating differentiation of spp. is limited by the independent occurrence of karyotype variation. As many as 3 karyotypes were found within a single sp. and in one case 4 spp. now recognized as distinct had identical karyotypes.—*R. N. Stewart.*

10992. Toole, Marguerite G., and Alfred E. Clarke. Chromosome behavior and fertility of colchicine-induced tetraploids in *Allium cepa* and *A. fistulosum*. *Herbertia* 11: 295-303. 1944.—Autotetraploids of both *A. cepa* and *A. fistulosum* were produced by treating germinating seeds with 0.1 and 0.5% aqueous colchicine for 3 hrs. A study of chromosome behavior during meiosis in autotetraploids showed that quadrivalents, trivalents, and univalents are more frequent in *A. cepa* than in *A. fistulosum*. Quadrivalents in the



*A. cepa* tetraploid form a variety of rings and chains held together by terminal or subterminal chiasmata; those in the *A. fistulosum* tetraploid usually consist of 2 localized pairs of bivalents joined together by a terminal or subterminal chiasma. These autotetraploids are highly self-sterile, owing to meiotic irregularities in chromosome behavior, but some seeds were obtained after self-pollination.—*Auth. summ.*

## ANIMAL

10993. Corti, A. (*U. Turin, Italy.*) Per la conoscenza e per la storia del lacunoma. *Monitore Zool. Ital.* 55: 17-45. 1946.—A claim for priority and an emphasis of the statement, already made by the author in his previous papers, that vacuoles (the lacunoma) seen under fasting conditions in the epithelial cells of the small intestine are definite structures surrounded by a substance which by a special technique acquires the shape of irregularly twisted threads or a network, the Golgi net.—*N. Beccari.*

10994. Costello, Donald P. (*U. North Carolina, Chapel Hill.*) The giant cleavage spindle of the egg of *Polychaerus carmelensis*. *Anat. Rec.* 96(4): 65. 1946.—An abstract.

10995. Diller, Irene Corey. (*Lankenau Hosp. Res. Inst., Philadelphia, Pa.*) The effect of diet on mitotic activity in intestinal epithelium of the mouse. *Anat. Rec.* 96(4): 66. 1946.—An abstract.

10996. Griffen, A. B., and D. L. Lindsley, Jr. (*U. Missouri, Columbia.*) The production of gynandromorphs through the use of unstable ring-chromosomes in *Drosophila melanogaster*. *Anat. Rec.* 96(4): 59-60. 1946.—An abstract.

10997. Hyman, Libbie H. (*Amer. Mus. Nat. Hist., N. Y. C.*) The nature of the eosinophilous spheres in the intestinal epithelium of Planarians: A correction. *Amer. Microsc. Soc.* 65(3): 276-277. 1946.

10998. Kodani, M., and Curt Stern. (*U. Rochester, N. Y.*) An "invisible" chromosome. *Science* 104(2713): 620-621. 3 fig. 1946.—Males of *Drosophila melanogaster* were treated with 4,000 r of X-rays, and their offspring investigated genetically for induced chromosomal rearrangements. One change called R<sup>3</sup> (+) originated from at least 4 breaks in the left arms of chromosomes 2 and 3 and in the right arm of chromosome 4. Two more breaks occurred in the right arm of 3, causing a deficiency for the region 95D/E-97C1 of Bridges' map of the salivary gland chromosome. This region, present in the normal homologue of the deficient chromosome, formed a typical unpaired loop. The rearrangement, including the fragment, was distributed independently of sex, and the fragment represented an independent chromosome. It is assumed that the proximal end of the fragment was translocated to the base of chromosome 4. The fragment was invisible in aceto-carmine prepn. of metaphase plates of ordinary mitoses, although detectable in salivary-gland nuclei of the same individual.—*H. M. Kaplan.*

10999. Levine, Michael. Cytology of tumors in platyfish-swordtail hybrids. *Anat. Rec.* 96(4): 37. 1946.—An abstract.

11000. Marsland, Douglas A. (*New York U., N. Y. C.*)

Effects of pressure-centrifugation on the spindle, asters and cleavage pattern in the eggs of *Arbacia punctulata*. *Anat. Rec.* 96(4): 63-64. 1946.—An abstract.

11001. Schrader, Franz. (*Columbia U., N. Y. C.*) The elimination of chromosomes in the meiotic divisions of *Brachystethus rubromaculatus* Dallas. *Biol. Bull.* 90(1): 19-31. 6 fig. 1946.—The 4th lobe in all testes of the pentatomid *B. rubromaculatus* shows an aberrant meiosis of a very definite character. At metaphase the X and the Y take a normal position in the spindle, but the autosomal tetrads that have gathered in a clump in late diakinesis are shunted laterally out of the middle region of the cell, away from the polar axis. The 2 sex chromosomes divide equationally in this 1st division while the autosomal aggregate passes unaltered to either pole. In the 2d division the X and Y again behave as in normal meiosis and separate to opposite poles. The autosomal aggregate, if present, again passes undivided to either pole. Since the sex chromosomes behave normally throughout, and the aggregate of autosomes remains unchanged during both divisions, the following spermatids are produced: X; Y; X + autosomes; Y + autosomes. The last 2 types form abnormally large but otherwise normal sperms. It is more than likely that they do not function directly in the genetics of the species, but it is quite possible that in the polyspermic eggs they furnish unusually large quantities of nucleoproteins which are utilized by the developing embryo. The evolution of the abnormal lobe of the testis may thus confer an advantage on the species through its effect on the embryonic stages.—*Franz Schrader.*

11002. Seshachar, B. R. (*U. Mysore, Bangalore, India.*) Nuclear reorganization in *Epistylis*. *Current Sci.* 15(7): 198. 4 fig. 1946.—Asexual breakdown of the macronucleus, or hemixis (Diller), was found in *E. plicatilis*, *E. anastatica*, and *E. articulata*, peritrichous ciliates. Total fragmentation was the most common type of hemixis.—*S. W. Brown.*

11003. Shay, D. E. (*U. Maryland, College Park.*) Observations on the cellular enclosures of the mid-gut epithelium of *Periplaneta americana*. *Ann. Ent. Soc. America* 39(2): 165-169. 4 fig. 1946.—Tissues of the mid-gut of *P. americana* studied after fixation with Bouin's and stained with azan and iron hematoxylin showed tall, columnar epithelial cells having the appearance of a brush border. Regeneration of the epithelial cells appears to be entirely from the germinal center and they are devoid of secretory granules. There is no evidence of basal protoplasmic striations in the epithelial cells. The cells of the anterior region of the mid-gut contain an abundance of granules and seem to be secretory; those cells in the posterior region having few granules seem to be concerned with absorption. Mitochondria in the form of rods, filaments and granules are present in the epithelial cells in all regions of the mid-gut. In the young cells which have not become digestive in their function, the mitochondria are scarce with the exception of a few granules at the periphery of the cell. There is no definite zonation of the mitochondria in the mature epithelial cells.—*D. E. Shay.*

11004. Wilson, J. Walter, and Elizabeth Leduc. (*Brown U., Providence, Rhode Island.*) Stimulation of mitosis in mouse liver. *Anat. Rec.* 96(4): 38-39. 1946.—An abstract.

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 10946, 10953, 10992, 10998, 11352, 11668, 11695, 11799, 11802, 11811, 11818, 11825, 11828, 11836, 11862, 11865, 11880, 11883, 11898, 11928, 11932, 12113, 12141, 12231, 12235, 12246, 12368, 12371, 12375, 12396, 12402, 12468, 12478, 12479, 12482, 12490, 12547, 12646, 12719, 12721, 12726, 12729, 12734, 12735, 12736, 12741, 12750, 12752, 12859)

## GENERAL

11005. Beadle, George W. (*Stanford U., Calif.*) The gene. *Proc. Amer. Phil. Soc.* 90(5): 422-431. 4 fig. 1946.—A general discussion of the nature of the gene, illustrated by the author's experience with *Neurospora*. An evolutionary hypothesis is suggested according to which autotrophic organisms arose from the "protogene" and from these, in turn, protogene-like viruses have recurred by a reversal of the process.—*P. S. Stokely.*

11006. Colin, Edward C. *Elements of genetics*. 2nd ed. 402p. illus. The Blakiston Co.: Phila., Pa. 1946. Pr. \$3.50.—For 1st ed. see *Biol. Abstracts* 15: entry 11758. An elementary, personalized textbook for a beginning course in

genetics. The emphasis is upon Mendel, simple Mendelism, heredity in man, the interaction of heredity and environment and the application of our knowledge of heredity to the problem of evolution. This 2nd ed. includes the recent work on the genetics of the blood groups, the application of the chi square test to pedigrees and a discussion of mutations and genes in the light of recent contributions. Topics revised also include sex determination, sex differentiation, sex linkage, polyploidy and the positional effect. There is a brief treatment of eugenics.—*Conway Zirkle.*

11007. Mangelsdorf, Paul C. (*Harvard U., Cambridge, Mass.*) Treating genetic data with punched cards. *Genetics* 32(1): 96. 1947.—An abstract.

11008. Spiegelman, S., and M. D. Kamen. (*Washington U. Sch. Med., St. Louis, Mo.*) Genes and nucleoproteins in the synthesis of enzymes. *Science* 104(2712): 581-584. 1 fig. 1946.—Genes continually produce, at different rates, partial replicas of themselves which enter the cytoplasm. These replicas are nucleoprotein in nature and possess to varying degrees the capacity for self-duplication. Their presence in the cytoplasm controls the type and amts. of proteins and enzymes synthesized. These cytoplasmic self-duplicating units, like all such entities, compete with one other, and the outcome determines the enzymatic make-up of the cytoplasm. The ultimate result of this competition could be changed by varying the conditions under which it takes place. The unique feature of this theory is that while supplying a link between gene and enzyme, it at the same time predicts that cells with identical genomes need not possess identical enzymatic constitutions. Whether a character is transmitted in Mendelian fashion will depend on the relative rates of duplication of the cytoplasmic units as compared with their rate of production from the gene.—H. M. Kaplan.

## PLANT

11009. Bishop, Charles J. (*Harvard U., Cambridge, Mass.*) The genetical basis of sterility in tetraploid broccoli. *Genetics* 32(1): 79. 1947.—An abstract.

11010. Bonner, David. (*Stanford U., Calif.*) Further studies of mutant strains of *Neurospora* requiring isoleucine and valine. *Jour. Biol. Chem.* 166(2): 545-554. 1946.—Investigations of biochemical mutations in *N. crassa* support the thesis that there exists a 1:1 relation between chemical reaction and gene. An apparent exception was reported previously. Strain 16117, which differs by a single gene from the parent strain, was reported to have a growth requirement for the 2 amino acids, isoleucine and valine. Investigations as to the nature of this block are reported. This strain cannot use the keto acid analogue of isoleucine, prep. synthetically, in place of isoleucine, but it can use the keto acid analogue of valine. The keto acid analogue of isoleucine, however, specifically inhibits conversion of  $\alpha$  keto-isovaleric acid to valine. It is, therefore, suggested that strain 16117 is genetically blocked in the conversion of  $\alpha$  keto- $\beta$ -methyl-n-valeric acid to isoleucine and that this genetic block results in an accumulation of this keto acid which in turn inhibits the conversion of  $\alpha$  keto-isovaleric acid to valine. This genetic block in the synthesis of isoleucine would therefore give a strain with the apparent double requirement for isoleucine and valine of strain 16117.—David Bonner.

11011. Brieger, F. G. (*U. São Paulo, Piracicaba, Brazil.*) Estudos sobre a inflorescência de milho com referência especial aos problemas filogenéticos. [Studies on the inflorescence of corn, with special reference to the phylogenetic problems.] *Bragantia* 5(11): 659-716. 1945.—The Brazilian "Paulista" pop corn and "Paulista" pod corn were crossed with *Euchlaena*. The descendants of these *Zea*  $\times$  *Euchlaena* crosses were studied morphologically. Several theories are discussed and a general hypothesis is suggested concerning the role of a modifier shift in evolution. 16 full-page drawings and original photographs illustrate the text and a detailed English summary is included.—A. Grossmann.

11012. Cameron, James W. (*Harvard U., Cambridge, Mass.*) A study of the genic control of carbohydrates in maize endosperm. *Genetics* 32(1): 80-81. 1947.—An abstract.

11013. Chilton, S. J. P., and H. E. Wheeler. Studies on the nature of "segregation" in certain plus strains of *Glomerella*. *Phytopath.* 37(1): 4. 1947.—Evidence obtained from ascospore cultures of perithecial strains of *G. cingulata* indicates that new strains arose by mutation from the plus strain, and the ascus ratios of plus and minus strains were detd. by nuclei entering and pairing in the ascogenous hyphae and fusing in the ascus.

11014. Dayton, Wm. A. (*U. S. Forest Serv., Washington, D. C.*) A freak black-eyed-susan. *Jour. Heredity* 37(11): 331-332. 1 fig. 1946.—The great variability of the black-eyed-susan (*Rudbeckia hirta*) has often been commented upon and teratological forms of the sp. have been descr. by several authors. The specimen here descr., from Fairfax Co., Va., consisted of a forked ribbon-growth stem, each fork terminat-

ing in a triple fasciated head, the disks forming an elongated central band.—W. A. Dayton.

11015. Dermen, Haig. (*U. S. Pl. Indust. Sta., Beltsville, Md.*) Periclinal cytochimeras and histogenesis in cranberry. *Amer. Jour. Bot.* 34(1): 32-43. 23 fig. 1947.—From colchicine treatment of vegetative buds of cranberry vars. 5 polyploid types of plants were obtained. Contrasted with diploid plants with small stomates, small leaves, and slender stems, these had, in general, the following vegetative characteristics: (1) large stomates, small leaves, and slender stems; (2) small stomates, large leaves, and thick stems; (3) large stomates, large leaves, and thick stems; (4) small stomates, large leaves, and slender stems; (5) small stomates, small leaves, and thick stems. These characteristics were associated with the chromosome number in the 3 cell layers in the stem apical meristem. The 3 layers in the 1st plant had 4x, 2x, 2x constitution in respective order of layering; in the 2d plant, 2x, 4x, 4x; in the 3d, 4x, 4x, 4x; in the 4th, 2x, 4x, 2x; and in the 5th, 2x, 2x, 4x. The ontogeny of the epidermis in the leaves, stem, and all flowering parts and organs was traced to the 1st layer (L-I). The mesophyll is partly from L-II and partly from L-III. Histogenesis of venation is identical with mesophyll. In the stem the origin of a uniseriate hypodermis was traced to L-II. Often, however, parts of the outer cortical tissue were also derived from L-II, this sometimes extending into the pith. In general, the remaining tissues—cortical, stele, and pith—of the stem were derived from L-III. Some histological preparations have indicated that the microsporogenous tissue is derived from L-II. This has been confirmed by pollen samples. The possibility that in certain rare instances portions of microsporogenous tissue may be derived from either L-I or L-III—more often from the latter—should not be excluded. Thus mixed pollen with respect to chromosome complement may be expected from flowers of cranberry plants with cytochimeral structure. The study of the 2x-2x-4x chimeral plant has shown that all 3 apical meristem layers (referred to in the text as primary histogenic layers) enter into the development of the fleshy parenchymatous tissue of the cranberry fruit. Placental tissue giving rise to ovules was from L-II, except a single outer layer, the epidermis, which was from L-I. L-I gave rise to the entire integument observed at the end of the mature embryo-sac stage. The megaspore mother cell, which lies immediately under the epidermis, is derived from L-II. On the basis of the present study it is suggested that Hanstein's histogenesis theory and Schmidt's tunica-cortex theory be put aside and reference made to tissues by their names, such as epidermis, hypodermis, cortex, etc., and reference made to apical layers by number, such as L-I, L-II, etc., and refer to these layers as primary histogenic layers, or simply apical layers.—Haig Dermen.

11016. Dermen, Haig. (*U. S. Dept. Agric., Beltsville, Md.*) Histogenetic basis of some bud sports and variegations. *Genetics* 32(1): 84-85. 1947.—An abstract.

11017. Fogel, Seymour. (*Queens Coll., Flushing, N. Y.*) Allelic differentiation and correlation in gene action. *Genetics* 32(1): 86. 1947.—An abstract.

11018. Ford, Joan Munro. (*U. Tasmania, Hobart.*) Saltant production by wave lengths of visible and long ultraviolet monochromatic irradiation, and a comparison with saltants produced by short wave lengths of monochromatic ultraviolet irradiation in the fungus *Chaetomium globosum*. *Jour. Gen. Physiol.* 30(3): 211-216. 2 pl. 1947.—Saltants have been produced in *C. globosum* by longer wave lengths of monochromatic irradiation than previously reported. At long wave lengths, 365 m $\mu$  (an u.-v. line) and 404 m $\mu$  (a visible violet line), 52 saltants were produced in 1,391 exptl. colonies, and at the short u.-v. wave lengths, 265 m $\mu$  and 280 m $\mu$ , 486 saltants were produced in 1,401 exptl. colonies. Only 2 of the 52 saltants produced by long wave lengths were K saltants, although 114 of the 486 saltants produced by short u.-v. wave lengths were K saltants. Only few saltants appeared in control colonies. Expts. have indicated that, for optimum saltant production, a greater number of spores are killed by longer wave lengths than are killed by short wave lengths.—J. M. Ford.

11019. Fries, Nils. (*U. Uppsala, Sweden.*) X-ray-induced parathiotrophy in *Ophiostoma*. *Svensk Bot. Tidskr.* 40(2): 127-140. 1946.—Out of 94 x-ray-induced physiological mutations of *O. multiannulatum*, 13 were parathiotrophic

i.e., incapable of assimilating 6-valent S (as  $\text{SO}_4$  or sulfone). Of compounds containing 2-valent S, cysteine and cystine represented good sources of S for these mutants;  $\text{Na}_2\text{S}$ ,  $(\text{NH}_4)_2\text{S}$  and  $\text{CH}(\text{SCH}_3)_3$ , however, could also be assimilated. Only one of the parathiotrophic mutants was capable of utilizing 4-valent S ( $\text{SO}_2$ ), but this property was shown only in the 1st of the expts. with this strain. A possible explanation of this fact is suggested. From mating expts. it appeared that at least 3 non-allelic genes control the reduction of  $\text{SO}_4$  in *O. multiannulatum*. 5 of the parathiotrophic mutants could adapt, i.e., return to euthiotrophy, in a medium with  $\text{SO}_4$  as the only source of S. Such adapted mycelia seemed otherwise identical with that of the euthiotrophic original strains, and in mating expts. they behaved the same. The possibility that the adaptation is a reversal of mutation is discussed.—H. Horn of Rantien.

11020. Friesen, H. A. Awn-barbing in barley. *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 292-297. 1946.—The inheritance of awn-barbing was studied in crosses of barley vars. having intermediate smooth and very smooth awns and lacking the gene *R* for rough awns. 2 genes were found to govern awn smoothness in these vars., 1 being *S* hypostatic to *R* as previously reported and the other, termed *S*<sub>1</sub>, hypostatic to *S*. The genotype *rrSSS*<sub>1</sub>*S*<sub>1</sub> has intermediate smooth awns, *rrssS*<sub>1</sub>*S*<sub>1</sub> has smooth awns, and *rrssS*<sub>1</sub>*S*<sub>1</sub> has very smooth awns.—Auth. abst.

11021. Frost, H. B. (*Citrus Expt. Sta., Riverside, Calif.*), e C. A. Krug. (*Inst. Agron., Campinas, Brazil.*) Quimeras periclinais diploides-tetraploides surgidas em forma de variações somáticas em Citrus. [Diploid-tetraploid periclinal chimeras appeared in form of somatic variations in Citrus.] *Bragantia* 4(7): 449-474. 1944.—An amplified translation [see B. A. 17(3): entry 8024].

11022. Hull, Fred H. (*Agric. Expt. Sta., Gainesville, Fla.*) Overdominance and corn breeding where hybrid seed is not feasible. *Jour. Amer. Soc. Agron.* 38(12): 1100-1103. 1946.—Evidence for overdominance (superior *aA*) in yield and vigor of corn from failure of ear-row breeding, failure of synthetic vars., and failure of 2d and later cycle inbred lines in hybrid combinations to improve yield is reviewed. Theoretical regression relations of *F*<sub>1</sub> and homozygous parents for different degrees of dominance bias are noted. It is reported that regression relations in a number of sets of corn yield data are in general agreement with the hypothesis of overdominance, but not with the more generally held hypothesis of no more than complete dominance. A method of breeding based solely on selection for general combining ability and directed towards the optimum gene ratio for overdominance in an open breeding population is outlined.—F. H. Hull.

11023. Jayaweera, D. M. A. (*Roy. Bot. Gard., Peradeniya, Ceylon.*) The production of Hibiscus hybrids. *Trop. Agric. [Ceylon]* 98(4): 19-25. 1942.—The technique of breeding Hibiscus is discussed. Horticultural vars. are crossed easily, interspecific crosses are more difficult. Directions for growing hybrid seeds, a list of crosses which have been attempted and the results obtained are given.—C. A. Schroeder.

11025. Johnson, L. P. V. (*U. Florida, Gainesville*), and C. Heimbürger. (*Ontario Dept. of Lands and Forests, Toronto.*) Preliminary report on interspecific hybridization in forest trees. *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 308-312. 1946.—Interspecific hybridization in various forest tree genera gave the following results: *Populus*, 43 crosses; *Picea*, 12; *Pinus*, 4; *Betula*, 14; *Fraxinus*, 5; *Ulmus*, 7; and *Tilia*, 9. The hybridity of most of these materials has been proved or strongly indicated by various criteria; for some of the materials, hybridity is assumed on the basis of seedling production under conditions that largely precluded the possibility of self- or chance-pollination.—Auth. abst.

11026. Johnson, L. P. V. A note on inheritance in *F*<sub>1</sub> and *F*<sub>2</sub> hybrids of *Populus alba* L. × *P. grandidentata* Michx. *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 313-317. 1 pl. 1946.—At 5 yrs. of age, avg. hts. in ft. were: *Populus alba*, 14; *P. grandidentata*, 11.7; *F*<sub>1</sub>, 17.6; *F*<sub>2</sub>, 9.5. On the basis of an *F*<sub>2</sub> population of 168 trees, modes of inheritance were assumed for leaf characters as follows: pubescence, 4 cumulative factors; color, 1:2:1 monohybrid ratio; midrib, 42:15:6:1 trihybrid ratio; shape, margin, apex, and base, each inherited on the basis of multiple factors. The high rooting capacity of *P. alba* (92%) was transmitted to

the *F*<sub>1</sub> hybrid as a dominant character. It is suggested that *P. alba* is homozygous for 1 or more highly-determining, dominant alleles not possessed by *P. grandidentata*. Backcrossing failed to increase the degree of rooting. Comparable results from *P. tremuloides* indicated that this sp. carries an inhibitor for the *P. alba* rooting factor or factors and is deficient for the rooting factor or factors possessed by *P. grandidentata*.—Auth. abst.

11027. Johnson, L. P. V., and E. C. Bradley. (*U. Florida, Gainesville.*) Hybridization technique for forest trees. *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 305-307. 1 pl. 1946.—The relative merits of different materials as coverings to protect receptive ♀ flowers against chance pollination were studied, and a combination of glassine (inner) and kraft (outer) bags was adopted. Pollination was effected as follows: the kraft bag was removed and the glassine bag punctured with the point of a specially designed pollen gun; the pollen was then driven into the bag by squeezing the bulb of the gun; finally, the puncture was sealed with an adhesive patch and the kraft bag replaced. The pollen gun attaches to pollen containers (small Erlenmeyer flasks) that can be stored over  $\text{CaCl}_2$ .—Auth. abst.

11028. Johnson, L. P. V., and H. W. Holtz. (*U. Florida, Gainesville.*) Colchicine treatment techniques for sprouted seeds and seedlings. *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 303-304. 1 pl. 1946.—Colchicine techniques were developed on the principle that sprouted seeds or seedlings should not be completely immersed in colchicine solns. since the root, an earlier developing, more actively dividing absorptive organ, will become overtreated before the stem receives sufficient treatment. Sprouting seeds are placed, stem end down, in holes in a corrugated rubber disk fitted into a Petri dish containing colchicine soln. A covering of moist filter papers protects the upturned roots from drying. Seedlings are grown in small pots that are inverted over similar pots containing vials of colchicine soln. so that the seedlings in the upper pots are immersed in the vials. In both methods a 0.2% aqueous colchicine soln. is used, and immersion ranging from 6 to 48 hr. is required depending on the spp.—Auth. abst.

11028A. Johnsson, Helge. (*Forest Tree Breed. Inst., Ekebo, Källstorp, Sweden.*) Progeny of triploid *Betula verrucosa* Erh. *Bot. Notiser* 1946(2): 285-290. 2 fig. 1946.—Four individuals were used in this expt.—2 natural triploid *B. verrucosa*, 1 diploid of the same species, 1 *B. pubescens* (tetraploid) and a 42-chromosomal individual probably representing *F*<sub>1</sub> of *B. pubescens* × *B. verrucosa*. Fertility of triploids was greatly reduced in all combinations. However, no appreciable difference was obtained between triploid × triploid and triploid × diploid *B. verrucosa*. Crosses between *B. verrucosa* and *B. pubescens* showed strong sterility. Triploid *B. verrucosa* × triploid (*B. pubescens* × *B. verrucosa*) yielded no mature seed. From triploid crosses yielding 481 seeds with embryos, only 140 plants were obtained. In progenies of triploids, indications are that chromosome arrangement in meiosis is highly irregular. The result of chromosome counts showed that plants have appeared with 2*n* numbers between 29 and 51 except 43 and 47. A comparison of frequencies of combinations expected with those observed shows over-representation of 2*n* = 29-37, under-representation of 2*n* = 38-47 and a surplus of 2*n* = 48-51. It is concluded that these situations resulted from a high selective elimination of gametes and zygotes. No unreduced gametes seemed to have functioned. The triploid progenies showed wide variability in vitality and morphological characters.—H. L. Blomquist.

11029. Kostoff, D. Poliploidiiata i neinata rolia v evoliut-siata i selektsiata na rasteniata. [Polyploidy and its role in evolution and plant breeding.] *Spisaniye Zemedelskiihe Opini Instituti (Zeitschr. Landw. Versuchsta. Bulgarien)* 10(4): 3-86. 1940.—Polyploid plants experimentally produced in various spp. of *Nicotiana*, *Lactuca*, *Festuca*, *Taraxacum*, *Triticum*, *Beta*, *Lycopersicum*, *Anthriscum*, etc., differed from the diploids in many respects. Characters of tetraploid plants can be divided into 3 groups in respect to their direction of variability: 1) characters that change in a definite direction following chromosome doubling; 2) characters that change in a certain direction, usually depending on chromosome number (this group includes most characters); 3) characters that usually are not influenced by chro-



mosome doubling—size of plastids is the only known character belonging to this group. Nuclei of tetraploids are always larger than those of diploids; triploids have larger nuclei than diploids and smaller than tetraploids; octoploids have larger nuclei than tetraploids. Nucleolar substance and nucleoli numbers increase with increase of the genomes. The increase in number of nucleoli depends on the number of SAT-chromosomes. In autopolyploids and in the majority of allopolyploids, cell size increases with the increase of genomes. The increase in the size of cells as a result of the increase in the number of the genomes depends on the var., sp., genus, etc., and to some extent on chromosome number. The autonomy of the size of chloroplasts in respect to the chromosome doubling suggests indirectly their genetic independence. Seeds of tetraploids are larger than those of diploids. Increase in size is due not only to the better nourishment of the tetraploid seed when the tetraploids show partial sterility, but to the polyploidy itself, because they are also larger in the cases when the tetraploids set as many seeds (or more) than the diploids. Development and in many cases growth is suppressed with increase in genome number. Cell division frequency in polyploids usually decreases with increase in genome number. This frequency is somewhat directly related to the ratio: nucleus surface/nucleus volume, which decreases with the increase in genomes. Leaves of polyploids differ in length and thickness from diploids. The ratio length/breadth of the leaves decreases with the increase of the genomes. This regularity is scarcely determinable in high polyploid plants. Thickness of leaves and intensity (dark green) of the green coloring of the leaves indirectly increase with increase in thickness of the leaves and indirectly with the increase in chromosome number. Size of the plant usually increases with increase in number of genomes in plants with small chromosome numbers and usually decreases in the plants with large chromosome numbers. Stems and roots change in all respects similarly to the general changes in the plant. Trichomes usually increase in size with increase in genome number. In some plants, the number of the trichomes increases per square unit. This seems to be the case when the trichomes develop from larger cells. Flowers increase in size in the majority of the cases with increase in number of genomes. The breadth of the corollas and petals usually increases. Change of length of flowers often depends on the variety in which the genomes increase. In some vars. length of flowers increases very significantly with increase in genome number; in other vars. no change or even a decrease in flower length was observed. In some cases this is regulated by chromosome number. Thickness of petals and intensity of corolla color increase with increase in number of genomes. Flowers that close at day and open at night gradually lose this regulatory ability with increase in number of genomes, since, parallel with this, thickness of the petals increases. This phenomenon is responsible for profound change in the biology of the plant, increasing cross-pollination among the higher polyploids (*Nicotiana* spp.). Anthers of tetraploids with relatively high fertility are larger than those of diploids. Thickness of styles, breadth of stigmas, heritable and non-heritable variability increase with increased polyploidy. Gene mutations and chromosomal aberration are more frequent among the polyploids than among the diploids, thus giving abundant material for the selection with greater adaptability. Frequency of abnormal leaves, flowers, etc., increases with polyploidy. Fertility of polyploids depends chiefly on meiotic processes. Triploids, pentaploids, etc., are highly sterile because they form multivalents and univalents and because the gametes formed do not possess all the chromosomes of the genomes. Tetraploids which usually form bivalents are highly fertile. Those which form multivalents and univalents are partially fertile, the latter depending on the frequency of formation of figures other than bivalents. Octoploids have lower fertility than the tetraploids or are usually self-sterile chiefly from the same causes. Fertility is a function of the gamete viability, although other factors may also participate and regulate fertility. Degree of the viability of the ♂ gametes usually parallels that of the ♀ ♀, although great variations and even exceptions have been occasionally observed. The shorter the chromosomes are in tetraploid plants, the more bivalents and the less frequently other figures (multivalents, univalents) are formed. Also, fertility is increased because plants with shorter chromosomes

more frequently form bivalents and less frequently other chromosome figures which lead to formation of abnormal and abortive gametes. The more genomes a plant has, the more abnormalities in meiosis, which leads to the formation of more abnormal and abortive gametes and to higher sterility. The significant morph. and physiol. changes conditioned by chromosome doubling can be treated as results of changes in the biochemical processes. In studying the biochemistry of polyploid tobacco plants in respect to the original forms, significant changes of various elements and compounds were found. In all 6 polyploid spp. and vars. studied, a significant increase of the alkaloid content occurred. In 4 of the tetraploids, N content was studied in comparison with that of the diploids. All showed an increase. In 3 cases out of 4, an increase in citric acid in the tetraploids was found. Cellulose content does not show a regular direction of change although there is a tendency toward a decrease with the increase of genome number. Observations in tobacco and 1 case in tomato polyploidy suggest an increase in cold resistance. Due to this character the polyploids can occupy areas with lower temps. than diploids. Plasticity of polyploids is increased but not indefinitely. Very high polyploids have relatively low viability. Polyploids with bivalents are more constant than those with multivalents and univalents, but as polyploids age multivalent groups decrease and fertility increases. Analyzing the fertility and the viability of the polyploid plants, it has been found that polyploidy itself is a limiting factor in evolution, because plants with too large chromosome numbers are less fertile and less viable than those with small chromosome numbers. Length of chromosomes also plays an important role. Since the fertility of tetraploids with longer chromosomes decreases much more than the fertility of tetraploids with shorter chromosomes, one can predict that polyploid plants with short chromosomes and with smaller chromosome numbers will be more fertile and consequently more valuable from a plant breeding and an evolutionary point of view, than plants with longer chromosomes and with large chromosome numbers. Generally speaking, the longer the chromosomes are, the more chiasmata per chromosome are formed and the more multivalents appear, which is one of the essential causes for formation of abnormal and non-viable gametes that lead to reduced fertility. Allopolyploids originating from  $F_1$ -hybrids with asyndesis do not usually form multivalents, while those with partial or total allosyndesis more readily form multivalents. Hence the former allopolyploids are more fertile than the latter. Whether chromosome doubling takes place in nature as it does under lab. conditions is no longer a question. The following agents play polyploidizing roles in nature: abnormal temp., wounding, parasites, chemicals, etc. The important problem is the degree of the fertility of the newly appearing polyploids and their survival in the struggle for existence. This has not been sufficiently investigated. Nevertheless, there are many examples which indicate that autopolyploids as well as allopolyploids which appear in nature can survive, and varying, they offer a large number of forms for natural selection. Cytogenetic investigations indicate that allopolyploids survive in nature and, consequently, allopolyploid spp. seem to be more plentiful than autopolyploid, although it is logical to expect that autopolyploid plants appear more often in nature than allopolyploids. Long chromosome plants that have comparatively large chromosome numbers are usually allopolyploids. Allopolyploids frequently are more vigorous and more fertile in respect to the parental plants than autopolyploids. The problem of crossability and polyploidy will be considered in 2 aspects: 1) Plants with larger chromosome numbers should be used in crosses as maternal plants, while those with smaller chromosome number for paternal plants, because the latter have thinner pollen tubes, which easily pass through the styles of the higher polyploids. The more genomes the polyploid has the larger cells it contains in its styles, through which thin pollen tubes pass easily. 2) Tetraploids do not cross as easily as diploids. This has been found true commonly in crossing diploids with diploids and tetraploids with tetraploid tobaccos of the following spp.: *N. suaveolens* × *N. alata*, *N. rustica* × *N. tabacum*, *N. rustica* × *N. glauca*. The crossability of tetraploid *N. glauca* with tetraploid *N. suaveolens* was about the same as that of the diploid combination. The positive and negative aspects of the physiological and chemical

changes of the tetraploids are discussed from an evolutionary and plant-breeding point of view. Finally, examples are given of the possibilities of the introduction of experimentally produced polyploids into agriculture. Plants are mentioned which might give positive results with chromosome doubling from an agricultural point of view.—*Dontcho Kostoff*.

11030. Krug, C. A., e Alcides Carvalho. (*Inst. Agron., Campinas, Brazil*.) Genética de Coffea. VIII. Hereditariedade dos caracteres de *C. arabica* L. var. *anomala* K. M. C. [Genetics of Coffea. VIII. Inheritance of the characters in *C. arabica* var. *anomala*.] *Bragantia* 5(12): 781-792. 1945.—Description and the genetical analysis are given for the characters of *C. arabica* var. *anomala*. *Anomala* is recessive to the "normal" *C. arabica*, a single pair of genes, *an an*, being responsible. The influence of this pair is remarkable, affecting nearly all the plant characters, such as habit of growth, type of branching, shape and size of leaves and morphology of flowers, fruits and seeds.—*A. Grossmann*.

11031. Langham, D. G. (*Inst. Nacion. Agric., Maracay, Venezuela*.) Initiation of a linkage map for sesame (*Sesamum indicum* L.). *Genetics* 32(1): 94. 1947.—An abstract.

11032. Langham, D. G. (*Inst. Nacion. Agric., Maracay, Venezuela*.) Seedling characters in sesame (*Sesamum indicum* L.). *Genetics* 32(1): 94. 1947.—An abstract.

11033. Little, T. M., H. A. Jones, and A. E. Clarke. The distribution of the male-sterility gene in varieties of onion. *Herbertia* 11: 310-312. 1944.—In 29 vars. of onions tested, 25 contained both the *Ms* and *ms* gene. Stockton G 36, homozygous for *ms ms*, arose from a single bulb. The only Southport Yellow Globe plant tested was homozygous for *ms ms*. Further testing may show the *Ms* gene present in this var. A glossy thrips-resistant selection out of Australian Brown was homozygous for *Ms Ms*. This variety was also derived from a single plant. Other Australian Brown plants tested have had the constitution *Ms Ms*, with one plant questionable. The widespread occurrence of the *Ms* and *ms* genes throughout the vars. of *Allium cepa* indicate that the mutation presumably for *Ms* to *ms* took place a long time ago or else has taken place more than once; otherwise the *ms* gene should be found in comparatively few vars.—*H. A. Jones*.

11034. Mangelsdorf, Paul C. (*Harvard U., Cambridge, Mass.*) The genetic nature of teosinte. *Genetics* 32(1): 95-96. 1947.—An abstract.

11035. O'Mara, Joseph G. (*U. Missouri, Columbia*.) The substitution of a specific *Secale cereale* chromosome for a specific *Triticum vulgare* chromosome. *Genetics* 32(1): 99-100. 1947.—An abstract.

11036. Pauley, Scott S. (*Harvard U., Cambridge, Mass.*) Early selection for heterosis in poplar hybrids. *Genetics* 32(1): 100. 1947.—Data from plants classified on the basis of vigor, demonstrated as young seedlings and compared with their showing at the end of the 1st season's growth indicate that selection for heterosis at such early periods is not entirely effective.

11037. Phadnis, B. A. (*Inst. Plant Indust., Indore, India*.) Xenia in cotyledon colour of gram (*Cicer arietinum*). *Current Sci.* 15(9): 256. 1946.—Certain seed coat colors are dominant or partially dominant over green. Dominance of yellow vs. green cotyledons is apparently controlled by a single pair of alleles, yellow dominant.—*S. W. Brown*.

11038. Rick, Charles M. (*U. California, Davis*.) A hair-suppressing gene that indirectly affects fruitfulness and the proportion of cross-pollination in the tomato. *Genetics* 32(1): 101-102. 1947.—An abstract.

11039. Rife, D. C., and H. C. Duber. (*Ohio State U., Columbus*.) Genes and species differences in Coleus. *Jour. Heredity* 37(11): 327-330. 3 fig. 1947.—Vars. of the species *C. laciniatus* are characterized by leaves with irregular margins and venation, a condition known as "irregular leaves". Vars. of *C. blumei* are characterized by regular leaves. Crosses between these 2 spp. revealed a simple dominant gene to be responsible for irregular leaves. No other differences are apparent between these spp. They possess the same genes for color variations and are highly interfertile.—*D. C. Rife*.

11040. Sansome, E. R., and L. Bannan. (*U. Manchester, Eng.*) Colchicine ineffective in inducing polyploidy in *Penicillium notatum*. *Lancet* 250: 828-829. 1946.—In expts. using the same strain of the organism, the authors failed to

confirm the claims of Gordon and McKechnie (*Lancet* 248: 47. 1945) that polyploidy increases the yield of penicillin from *P. notatum*. They also attempted to induce polyploidy in a high yielding strain of *P. notatum* with colchicine. Colchicine treatment did not increase the yield, nor did it increase the spore size, so that it is probably ineffective in causing polyploidy.—*H. B. Stoner*.

11041. Sears, E. R. (*U. Missouri, Columbia*.) The sphero-coccum gene in wheat. *Genetics* 32(1): 102-103. 1947.—An abstract.

11042. Singh, S. B. (*Sugarcane Res. Sta., Shahjahanpur, India*.) Viable sugarcane seed produced in the United Provinces. *Current Sci.* 15(9): 253. 1946.—Seedlings have been produced for the first time from locally produced fluff.—*S. W. Brown*.

11043. Singleton, W. Ralph. (*Connecticut Agric. Expt. Sta., New Haven, Conn.*) Mutations in maize inbreds. *Genetics* 32(1): 104. 1947.—An abstract.

11044. Smith, Luther. (*Washington State Coll., Pullman, Wash.*) Chromosomal fragments in diploid wheat and their usefulness in genetic studies. *Genetics* 32(1): 105. 1947.—An abstract.

11045. Stebbins, G. Ledyard Jr. (*U. California, Berkeley*.) Artificial synthesis of old and new polyploid species in *Bromus*. *Genetics* 32(1): 107-108. 1947.—An abstract.

11046. Whelton, Rita, and H. J. Phaff. (*U. California, Berkeley*.) A nonrespiratory variant of *Saccharomyces cerevisiae*. *Science* 105(2715): 44-45. 1947.—Ethylene oxide acting on *S. cerevisiae* produces mutant colonies. The mutant cells may fuse to become diploid. One fairly stable haploid mutant strain was examined in detail. Unlike the parent strain, resting suspensions of this variant showed no ability to oxidize either glucose or alcohol under aerobic conditions. The parent yeast showed absorption bands corresponding to reduced cytochromes A, B, and C at 605, 552, and 563 Å. Variant suspensions showed a strong band at 563 Å. (cytochrome C) but lacked the other 2 bands. The variant, unlike its parent, gave no test for indophenol oxidase with Nadi reagents according to the method of Keilin. The variant fermented the same sugars as the parent strain and used them as substrates for growth. Unlike the parent, it did not grow with alcohol as C source. Whereas the parent thallus occurred as single cells and pairs, that of the variant consisted of clusters of from 3 to 20 cells. The variant has lost the ability to form ascospores.—*H. M. Kaplan*.

11047. Wildman, S. G., F. A. Abegg, J. A. Elder, and S. B. Hendricks. (*U. S. Dept. Agric., Beltsville, Md.*) Observations on the inheritance of latex quality in *Cryptostegia*. *Arch. Biochem.* 10(1): 141-155. 1946.—Latex isolated from young shoots of *Cryptostegia* was analyzed for rubber content and for triterpene ester. *C. grandiflora* latex coagulum contained 70-80% rubber and <20% acetone-soluble material. *C. madagascariensis* coagulum contained <5% rubber and >80% acetone-soluble material of which 60% was triterpene ester. A hybrid between the 2 spp. resembled *C. grandiflora* in latex quality. In the  $F_2$  generation of the hybrid, 75% of the plants contained predominantly rubber and 25% contained predominantly triterpene ester in the latex coagulum. It is suggested that a common precursor is utilized for the formation of rubber and triterpene ester and that synthesis of these substances may be controlled by allelic genes.—*M. H. Adams*.

#### ANIMAL (EXCEPT MAN)

11048. Auerbach, C. (*U. Edinburgh*.) Abnormal segregation after chemical treatment of *Drosophila*. *Genetics* 32(1): 3-7. 1947.—Through treatment of wild-type ♂♂ with a nitrogen mustard, an X-chromosome was produced which showed an unusual type of segregation in all ♀♀ into which it was introduced. The segregation data are best explained by assuming an effect of the treatment on the centromere, as a result of which the chromosome tends to follow its homologue either the whole way into the same nucleus, or part of the way with subsequent loss on the spindle.—*C. Auerbach*.

11049. Blanc, Richard. (*U. Oklahoma, Norman*.) An inherited tendency to duplication of wings and antennae in *Drosophila melanogaster*. *Genetics* 32(1): 79-80. 1947.—An abstract.

11050. Brauch, Liane R., T. O. Sippel, Katherine F.

Hamilton, and W. L. Russell. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Strain specificity to transplants in the anterior chamber of the eye of the mouse. *Genetics* 32(1): 80. 1947.—An abstract.

11051. Carson, Hampton L., and H. D. Stalker. (Washington U., St. Louis, Mo.) A seasonal study of gene arrangement frequencies and morphology in *Drosophila robusta*. *Genetics* 32(1): 81. 1947.—An abstract.

11052. Caspari, Ernst. (Wesleyan U., Middletown, Conn.) Physiological action of the gene *a* in *Ephestia*. *Genetics* 32(1): 81-82. 1947.—An abstract.

11053. Cloudman, A. M., G. D. Snell, and Elizabeth Failor. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Variations in response of nine inbred strains of mice to eight spontaneous transplantable tumors. *Genetics* 32(1): 82-83. 1947.—An abstract.

11054. Dickie, M. M., and G. W. Woolley. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Linkage studies with the *Pirouette* gene in the mouse. *Jour. Heredity* 37(11): 335-337. 2 fig. 1946.—*Pirouette* (*pt*), a recessive choreic mutation, has been found to be linked with viable dominant spotting (*W*) with a cross-over % of 7.2. Further tests are being carried on to determine, if possible, the location of *pirouette* on the 3d chromosome. A linkage map of mouse genes is figured.—*Auth. abst.*

11055. Gerould, J. H. (Dartmouth Coll., Hanover, N. H.) Hybridization and female albinism in *Colias philodice* and *C. eurytheme*. A New Hampshire survey in 1943 with subsequent data. *Ann. Ent. Soc. America* 39(3): 383-396. 2 pl. 1946.—Population % of bright-orange *Colias eurytheme*, plus pale-orange hybrids, in territory long occupied by the clear-yellow *C. philodice* increased between 1940 and 1943 6-fold, i.e., from 1.5% ( $n = 658$ ) in 1940 to 9.2% ( $n = 1852$ ) in 1943. Meanwhile, the proportion of hybrids to pure *eurytheme* apparently decreased from around 50% ( $n = 10$ ) to 7% ( $n = 171$ ), but in 1940 only 1 *eurytheme* ♀ was taken (with 4 ♂♂ and 5 hybrid ♂♂). In 1943, however, 42 pure *eurytheme* ♀♀ were captured, with 117 *eurytheme* ♂♂, so that these could readily mate within their own sp. One such couple was caught; no crossmating was observed. In 1945, the foreign *Colias* population (*eurytheme* + hybrids) observed in a much smaller sample (301) was 24, or 8%, nearly equal to the 9% taken in 1943, while the % of hybrids to pure *eurytheme* had apparently increased to several times the 7% of 1943, viz., to around 20%, though only 5 hybrids and 19 pure *eurytheme* were taken. Yet the % of hybrids in the whole *Colias* population sample in 1940 and again in 1943 was <1; in 1945 it was approx. 1.5%, which figures may be compared with the 10% of *eurytheme* × *eriphyle* hybrids taken by Hovanitz at one locality in eastern California. In 1940, 17.2% ( $n = 244$ ) of captured *philodice* ♀♀ were white, and no white ♀ *eurytheme* was taken. In 1943, 23.4% ( $n = 689$ ) of the *philodice* ♀♀, as determined by the color pattern, were white, and 16.7% ( $n = 42$ ) of *eurytheme* ♀♀ were white. Combining both spp., 22.9% ( $n = 734$ ) of all ♀♀ were white. In 1945, the 26 white ♀♀ taken were all *philodice*, i.e., 21% of the 124 ♀♀ taken. Upper-surface color-pattern differences between the ♀♀ of *eurytheme* and *philodice* are descr. and illustrated. Though most white ♀♀ can readily be distinguished as *eurytheme* or as *philodice*, others, of intermediate color-pattern, are difficult to classify with as much accuracy as is possible in classifying "colored" ♀♀ (and ♂♂) as *eurytheme*, *philodice* or hybrid. "Colored" hybrids of a backcross to *eurytheme* are also difficult to distinguish from members of that "sp." of unquestionable purity (homozygosity), so that one is tempted to lump them under one sp. name. The use of "*Colias chrysotheme* Esper", however, to cover *C. eurytheme*, *C. philodice* and their hybrids is based on meager evidence, and seems likely to confuse, rather than promote, taxonomy and genetics.—J. H. Gerould.

11056. Ginsburg, Benson, and Edward Huth. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Some aspects of the physiology of gene controlled audiogenic seizures in inbred strains of mice. *Genetics* 32(1): 87. 1947.—An abstract.

11057. Ginsburg, Benson, and Flora Kaplan. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Evidence for the presence of a gene controlled oxidase in mouse skin extracts. *Genetics* 32(1): 87-88. 1947.—An abstract.

11058. Goodrich, H. B., and Ruth L. Hine. (Wesleyan

U., Middletown, Conn.) Interaction of genes in *Lebistes reticulatus*. *Genetics* 32(1): 88. 1947.—An abstract.

11059. Gottfried, C. M., and W. F. Hollander. "Ersatz auto-sexing" in pigeons. *Jour. Heredity* 37(11): 338-339. 1 fig. 1946.—Simultaneous use of 2 sets of sex-linked factors affords a breeder a perpetual sex distinction.—W. F. Hollander.

11060. Green, M. M. (U. Missouri, Columbia, Mo.) Red eye pigment in the lozenge allelic series of [*Drosophila*] *melanogaster*. *Genetics* 32(1): 89. 1947.—An abstract.

11061. Hazel, L. N., and W. F. Lamoreux. (Kimber Poultry Breed. Farm, Niles, Calif.) Family sex ratios in the fowl. *Jour. Heredity* 37(11): 333-334. 1946.—Family sex ratios were studied in a group of 8,355 White Leghorn chicks hatched during 1944 in a "polyallel" exptl. design which included 464 full-sib families. The average sex ratio was 49:79. The exptl. design and analysis were intended to measure the effects of sex linked lethals, autosomal modifiers of sex, complementary genes, and the non-random segregation of the sex chromosome upon the variation in family sex ratios. The observed differences among the sex ratios of paternal half-sib families, maternal half-sib families and full-sib families were no larger than expected to result from the random segregation of the sex chromosome into ovum or polar body during meiosis.—*Auth. summ.*

11062. Howells, T. H. (U. Colorado, Boulder.) The hereditary differential in learning—a reply to P. A. Pattie. *Psychol. Rev.* 53(5): 302-305. 1946.—Refutes Pattie's criticism that expts. with 2 breeds of chickens did not support the definition of hereditary influence as that which modifies learning rather than that which is uninfluenced by learning. Calls attention to aspects of interpretation which Pattie neglects and cites later exptl. evidence which confirms the earlier work.—S. S. Marsolf.

11063. Ives, Philip T., and Taylor Hinton. (Amherst Coll., Amherst, Mass.) Second chromosome inversions in a local wild population of *Drosophila melanogaster*. *Genetics* 32(1): 92-93. 1947.—An abstract.

11064. Kimball, R. F. (Johns Hopkins U., Baltimore, Md.) Heritable resistance to antiserum produced by antiserum and by trypsin in *Paramecium aurelia*. *Genetics* 32(1): 93. 1947.—An abstract.

11065. King, Edward D. (Harvard U., Cambridge, Mass.) Effects of temperature during x-radiation on *Drosophila*. *Genetics* 32(1): 93-94. 1947.—An abstract.

11066. Kühn, Alfred. Über Ergebnisse und Probleme der Genmutationsforschung. *Jahrb. preuss. Akad. Wiss. Phys.-Math. Kl.* 1940: 89-90. 1940.—A discussion. The importance of gene mutations for the conservation and evolution of species and races, especially their adaptation to various conditions of life may be proved experimentally. Ecologic adaptation races develop in model expts. The order of the differences in vitality found in mutation races under different environmental conditions, observations on numerical distribution of mutations in nature and considerations by the theory of probability show that considerable transformations of species during geological time are possible.—H. Simons.

11067. L'Heritier, Ph., et A. Sigot. (Fac. Sci., Strasbourg, France.) Contribution à l'étude du phénomène de la sensibilité au CO<sub>2</sub> chez la *Drosophile*. Influence du chauffage aux différents stades du développement sur la manifestation de la sensibilité chez l'imago. *Bull. Biol. France et Belgique* 80(2): 171-227. 1 fig. 1946.—Previous studies (L'Heritier and Teissier, 1938) have shown that some *Drosophila* individuals may be more sensitive to CO<sub>2</sub> than ordinary wild ones (Oregon inbred), and that this property is inherited. Heating to 30°-34°C influences this sensitivity. Specimens which should be hereditarily sensitive resist well if submitted to such temps. at certain periods of their development. This recovery can be permanent or transitory. Transitory recovery is observed whatever the genetic origin when imagoes or pupae are heated. Permanent recovery is shown only by flies whose sensitivity is inherited from father or maternal grandfather. If the father was sensitive, cure is provided by heating during the first embryonic instars; if the maternal grandfather was sensitive, heating must be done during larval stages. Permanent recovery seems to be related to elimination of a cytoplasmic agent responsible for hereditary transmission of sensitivity to CO<sub>2</sub>: L'Heritier and Teissier call



this "genoid". Heating may act through modification in the relative speeds of genoid and cellular multiplication. However, transitory recovery has possibly another cause, perhaps a modification in the process which leads from the genoid to the intoxication by  $\text{CO}_2$ .—J. B. Panouse.

11068. Merrell, David J. (Harvard U., Cambridge, Mass.) A gene in *Drosophila melanogaster* affecting eye color and fertility. *Genetics* 32(1): 96-97. 1947.—An abstract.

11069. Mittler, Sidney. (Illinois Inst. Technol., Chicago.) Influence of genetic environment on the production of bristles in *Drosophila melanogaster*. *Genetics* 32(1): 97. 1947.—An abstract.

11070. Moseley, Helen, Rydquest. (Storrs Agric. Expt. Sta., Storrs, Conn.) The early development of insulin-induced rumplessness in chicken embryos. *Genetics* 32(1): 98. 1947.—An abstract.

11071. Owen, R. D., Clyde Stormont, and M. R. Irwin. (U. Wisconsin, Madison.) An immunogenetic analysis of racial differences in dairy cattle. *Genetics* 32(1): 64-74. 1947.—The antigenic structure of the red blood cells of cattle is a complex inherited characteristic in which 2 breeds, the Holstein-Friesian and the Guernsey, have been shown to differ. Such breed differences are not of the "all-or-none" variety, but depend on contrasting frequencies of most of the units (antigens) comprising this complex characteristic. Each of the 30 antigens included in the study is present in some members of each breed, and absent in others. 17 are more frequent in Guernseys; 5 are similar in frequency in the 2 breeds; and 8 are more frequent in Holsteins. The presence of each antigen behaves with respect to its absence as though the 2 conditions were controlled by allelic genes. On this basis, the breed differences appear to depend upon contrasts in simple gene frequencies. Many of the different antigens are, however, associated in genetic complexes, and this renders the calculation of simple gene frequencies in some respects misleading. Another basis of breed comparison, here tentatively identified as differences in "allele-frequencies" as distinct from those in component "gene-frequencies", is suggested.—R. D. Owen.

11072. Pipkin, Sarah Bedichek. (American Univ., Beirut, Lebanon.) A search for sex genes in chromosome 2 of *Drosophila melanogaster*. *Genetics* 32(1): 100-101. 1947.—An abstract.

11073. Russell, W. L. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Splotch, a new mutation in the house mouse, *Mus musculus*. *Genetics* 32(1): 102. 1947.—An abstract.

11074. Schmieder, R. G., and P. W. Whiting. (U. Pennsylvania, Philadelphia.) Reproductive economy in the chalcidoid wasp *Melittobia*. *Genetics* 32(1): 29-37. 1947.—The principle of multiple sex-allelism demonstrated for *Habrobracon* is now shown not to apply to *Melittobia*. Breeding expts., including egg counts, indicate that despite close inbreeding, even with selfcrosses (haploid sons to mothers) in which only 2 alleles could be involved, all but a very small percentage of the eggs in many of the broods develop into ♀♀. There are very few unfertilized eggs (normal haploid ♂-producing) and no "bad" eggs or diploid ♂♂ corresponding to the sex homozygotes of *Habrobracon*. Some principle, as yet unknown, must then apply to this haplodiploid genus in which, because it is normally close-crossed, multiple sex-alleles would not effect reproductive economy.—P. W. Whiting.

11075. Shull, A. Franklin. (U. Michigan, Ann Arbor.) Natural hybrids of certain subspecies of lady beetles of the genus *Hippodamia*. *Genetics* 32(1): 103-104. 1947.—An abstract.

11076. Snell, G. D., A. M. Cloudman, and Elizabeth Failor. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) Evidence that a large number of genes and antigens determines the compatibility of tumor transplants in mice. *Genetics* 32(1): 105-106. 1947.—An abstract.

11077. Sonneborn, T. M., Ruth V. Dippell, and Winifred Jacobson. (Indiana U., Bloomington.) Some properties of kappa (killer cytoplasmic factor) and of paramycin (killer substance) in *Paramecium aurelia*, variety 4. *Genetics* 32(1): 106. 1947.—An abstract.

11078. Stone, Wilson S. (U. Texas, Austin.) A study

of recombination hybrids in the [*Drosophila*] virilis species group. *Genetics* 32(1): 108. 1947.—An abstract.

11079. Valencia, J. (Indiana U., Bloomington.) The cytology of structural changes involving specific loci in *Drosophila*. *Genetics* 32(1): 109. 1947.—An abstract.

11080. Valencia, R. Marie. (Indiana U., Bloomington.) Is there transmission of the effect of heterochromatin on variegation in *Drosophila*? *Genetics* 32(1): 109-110. 1947.—A report of the technique of experimentation being employed on expts. still in progress with results still not detd.

11081. Vilee, Claude A. (Marine Biol. Lab., Woods Hole, Mass.) A spectrophotometric analysis of the eye colors of *Habrobracon*. *Genetics* 32(1): 110-111. 1947.—An abstract.

11082. Warren, D. C. (Agric. Expt. Sta., Manhattan, Kans.) Double spur inheritance in the fowl. *Jour. Heredity* 37(11): 323-324. 1 fig. 1946.—A new autosomal recessive mutation in the fowl is described and data are presented showing the mode of inheritance. The expression of the character is similar to the dominant multiple (triple) spur which is characteristic of some breeds of poultry. Double spurs are identifiable in day-old chicks as well as adults. There is poor penetrance of the trait in homozygous double spurs with higher incidence among ♀♀.—D. C. Warren.

11083. Whiting, Anna R., and Bernice Goldis. (U. Pennsylvania, Philadelphia.) Dose-action curves for x-ray-induced dominant lethal and visible mutations in *Habrobracon* eggs. *Genetics* 32(1): 112. 1947.—An abstract.

11084. Whiting, P. W. (U. Pennsylvania, Philadelphia.) Linkage groups in *Habrobracon*. *Genetics* 32(1): 112. 1947.—An abstract.

11085. Winge, Ø. On the bicolor gene in dog. *Compt. Rend. Trav. Lab. Carlsberg [Copenhagen]* 24(11): 125-132. 1946.—From the Danish stud-books of the English Setter it appears beyond any doubt that 1) black-and-white (2-colored) parents may produce 3-colored offspring, and 2) that 3-colored parents may produce black-and-white offspring. This curious behavior makes the assumption of genes with complementary effects necessary. The genes in question are  $c^{bi}c^{bi}$  (the bicolor gene, being a member of the allelic series C: total color,  $c^a$ : saddle-restriction (Airedale),  $c^b$ : brindle-striped (Danes),  $c^{ma}$ : mask-restriction (Danes, Boxers)) and I, an interaction gene, the presence of which is necessary in the realization of the tricolor pattern. On this hypothesis, the mating of black-and-whites of the formula  $Cc^{bi}I$  will result in partly tricolor offspring, and the mating of tricolors of the formula  $c^{bi}c^{bi}I$  will produce some black-and-white puppies.—C. A. Jørgensen.

11086. Witschi, Emil, and John J. Mahoney. The genetics of the female prostate in rats. *Genetics* 32(1): 112-113. 1947.—An abstract.

#### MAN

11087. Armattoe, R. E. G., and Elsa M. McMillan. (Lomeshie Res. Centre, Londonderry, Northern Ireland.) Some factors in the mechanism of sex-determination. *Amer. Jour. Phys. Anthropol.* 4(2): 4. 1946.—An abstract.

11088. Falls, Harold F. (U. Michigan, Ann Arbor.) Inheritance of retinoblastoma. Two families supplying evidence. *Jour. Amer. Med. Assoc.* 133(3): 171-174. 1947.—The one family showed both horizontal and vertical occurrence, the other incidence in identical ♀ twins. It is recommended that the inheritance be cut by voluntary action or sterilization.—H. Leverne Williams.

11089. Greenhouse, J. M. Hereditary callus of the foot. *Jour. Heredity* 37(11): 340. 1 fig. 1946.—The proband, of English-German descent, is afflicted with a symmetrical hyperkeratosis of the soles of both feet and toenails. The pedigree showing 2 generations and part of the 3d indicates the trait to be a dominant one.—L. M. Dickerson.

11090. Gruenwald, Peter. (Mt. Sinai Hosp., N. Y. C.) A suggestion for recording case reports. *Jour. Heredity* 37(11): 344. 1946.—Many individual observations or case reports are valuable and significant but do not warrant publication in a full length technical article. It is suggested that the factual data with pertinent comment be sent to a central agency to be published on single sheets. These sheets would be offered on a subscription basis, by subject matter categories, to interested workers. Further discussion of the subject is suggested.—L. M. Dickerson.

11091. Hempel, H.-C. Palmo-Plantarokeratose (Unna-Throst) im Kindesalter. [Keratoma plantare et palmare in Childhood.] *Kinderärztliche Praxis* 12(2): 42-45. 1941.—Report of a case of palmar and plantar keratosis in an infant 2½ months of age. In a pedigree table, 10 cases from 4 generations were found to have or have had the same abnormality which, as apparently always in this disease, seemed to be inherited as a dominant.—*Gert v. Sydow.*

11092. McNutt, C. W. (U. Wisconsin, Madison.) Expression of hereditary brachydactyly in man. *Genetics* 32(1): 96. 1947.—An abstract.

11093. Neel, James V. (U. Rochester, Rochester, N. Y.) An estimate of the rate of mutation of the gene responsible for thalassemia in man. *Genetics* 32(1): 99. 1947.—An abstract.

11094. Neel, James V. (U. Rochester Sch. Med.), and William N. Valentine. (Rochester Municipal Hosp., Rochester, N. Y.) Further studies on the genetics of thalassemia. *Genetics* 32(1): 38-63. 1947.—Thalassemia minor is a mild, hypochromic, microcytic anemia observed in the U. S. chiefly in families of Italian and Greek extraction. Thalassemia major is a much more serious familial condition, qualitatively similar to thalassemia minor, but quantitatively more severe, and usually terminating fatally in childhood. The 2 anemias are frequently associated in the same kinship, and whenever an individual with thalassemia major is found, both parents have thalassemia minor. The theory has previously been advanced that thalassemia major and minor are related as homozygote and heterozygote. In previous studies and compilations of the literature, there was observed an apparent excess of thalassemia minor over the expected 1:1 ratio in marriages between normal persons and those with

thalassemia minor. The present paper presents data on 17 additional kinships. In 60 segregants derived from several different types of marriages (data of this and a preceding paper; probands excluded), 31 persons had thalassemia minor, whereas expectation was 31.89. A summary of all the available data yields 114 segregants, of whom 69 were affected, whereas expectation was 61.65.  $\chi^2$  for the difference is 1.908, with  $P = 0.1-0.2$ . Thus, in the light of further work the apparent excess of affected persons has largely tended to disappear. The frequency of thalassemia major has previously been detd. by survey methods (0.0004), and the frequency of thalassemia minor calculated from this (0.04). The selective disadvantage of thalassemia major is 1. The selective disadvantage of thalassemia minor may be estimated at 0.1-0. The mutation rate necessary to maintain the population at equilibrium if minor is at a selective disadvantage of 0 (i.e., functional recessive) is in the neighborhood of 0.0004, with higher rates required if selection operates against the heterozygotes. Such a rate would place this factor in the category of a frequently mutating gene, in terms of life cycles. Alternatives to postulating so high a mutation rate are considered.—*Auth. summ.*

11095. Piers, F. Multiple pigment defects. *Jour. Heredity* 37(11): 341-344. 2 fig. 1946.—A peculiar symmetrical wedge-shaped pigmentation was found in 2 normal Hindu children (sibs). The father showed a mask-like pigmentation of the face. Associated were other irregularities of pigmentations in the 2 children. The Hindu race is predisposed to symmetrical facial pigmentations. The peculiar syndrome described here is possibly due to an irregular dominant mechanism. The presence at the same time of an abortive form of albinoidism may be coincidental.—*F. Piers.*

## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 11007, 11193, 11292, 11335, 11337, 11361, 11420, 11425, 11436, 11452, 11517, 11553, 11560, 11572, 11608, 11620, 11630, 11825, 11828, 12111, 12369, 12424, 12430, 12437, 12718)

11096. Committee for the Calculation of Mathematical Tables. Mathematical tables. I. Circular and hyperbolic functions, exponential and sine and cosine integrals, factorial functions and allied functions, hermitian probability functions. 2d ed. 72p. Published for the British Association by the Cambridge U. Press: Cambridge, Mass.: 1946.—The first edition of this useful set of tables is out of print. The 2d edition reissues the tables, with corrections of known inaccuracies in the 1st edition. The introduction of the 1st edition is largely omitted in the 2d edition. The tables include Multiples of  $\frac{1}{2}\pi$  [1(1)100; 15]: Circular Sines and Cosines [Radians, 0.0(0.1)50.0; 15]: Circular Sines and Cosines [Radians, 0.000(0.001)1.600; 11]: Hyperbolic Sines and Cosines of  $\pi x$  [0.000(0.0001)0.0100; 15]: Hyperbolic Sines and Cosines of  $\pi x$  [0.00(0.01)4.00; 15]: Hyperbolic Sines and Cosines of  $x$  [0.0(0.1)10.0; 15]: Exponential integral [0.0(0.1)15.0; 11]: Sine and Cosine Integrals 0.0(0.1)5.0, 5.0(0.1)20.0(0.2)40.0; 11, 10]: Factorial function [0.00(0.01)1.00; 12]: Logarithmic Factorial integral [0.00(0.01)1.00; 10]: Digamma Function [0.00-0.01]1.00, 10.0(0.1)60.0; 12]: Trigamma Function [0.00-0.01]1.00, 10.0(0.1)60.0; 12]: Tetragamma Function 0.00(0.01)1.00, 10.0(0.1)60.0; 12]: Pentagamma Function 0.00(0.01)1.00, 10.0(0.1)60.0; 10, 12]: Hermitian Probability Functions:  $H_h(x)$  [ $n = 0(1)21$ ,  $x = -7.0(0.1) + .6$ ; 10]:  $H_h(x)H_h(x)/\{H_h(x)\}^2$  [ $-7.0(0.1) + 5.0$ ; arises from 9 to 3]. The notation indicates starting point, argument increase, end point and places of tabulation for each table.—*J. W. Gowen.*

11097. DeLury, D. B. (Virginia Polytech. Inst., Blacksburg.) The analysis of latin squares when some observations are missing. *Jour. Amer. Statist. Assoc.* 41(235): 370-389. 1946.—A detailed discussion with examples from a  $4 \times 4$  square with several replications of simplified computations which are advantageous when a particular exptl. design is routine use.—*L. C. Cole.*

11098. Dixon, W. J. (U. Oregon, Eugene), and A. M. Mood. (Iowa State Coll., Ames.) The statistical sign test. *Amer. Statist. Assoc.* 41(236): 557-566. 1946.—A simple test of the equality of 2 columns of paired observations

utilizing the signs and ignoring the magnitude of the intra pair differences. Equivalent to the test described by Cole [see B. A. 19(9): entry 17990] but differently tabulated to show the number of disagreeing signs compatible with different levels of significance for up to 100 pairs of observations. Efficiency is compared with that of the  $t$ -test for certain conditions.—*L. C. Cole.*

11099. Hamming. Problemen by het samenvatten van rassenproeven. [Problems in combinations of variety tests.] *Landbouwk. Tijdschr.* 1946(700): 466-467. 1946.—The calculated mean error  $\phi$  has in many cases nothing to do with accident and is not a standard deviation. Quite often a low  $\phi$  is connected with unreliable results.—*I. Rietsema.*

11100. Hoel, Paul G. Introduction to mathematical statistics. 258p. John Wiley and Sons, Inc.: New York, 1947. Pr. \$3.50.—This book is designed for a 2-semester course in mathematical statistics, prerequisite, elementary calculus. The subjects discussed and the order of treatment are as follows: frequency distributions of one variable, their representation, and 4 moments; theoretical frequency distributions of one variable, including binomial, Poisson, and multinomial distributions; large-sample theory of one variable, frequency distributions and properties; frequency distributions of 2 variables, including linear and curvilinear regression and correlation; theoretical frequency distributions of 2 variables and their properties; frequency distributions of  $>2$  variables, multiple linear regression and correlation, and linear discriminant functions; small-sample distributions, their expected values and unbiased estimates, confidence limits,  $\chi^2$  distributions, student's  $t$ ,  $F$  distribution; non-parametric methods, Tchebycheff's inequality, law of large numbers, tolerance limits; testing goodness of fit,  $\chi^2$  distribution, contingency tables, frequency curves; testing statistical hypotheses, maximum likelihood; statistical design in expts., analysis of variance, stratified sampling and sequential analysis. References and exercises follow each chapter.—*J. W. Gowen.*

11101. Panse, V. G. (Inst. Plant Indust., Indore, India.) Plot size in yield surveys on cotton. *Current Sci.* 15(8): 218-219. 1946.—Small plots,  $\frac{1}{200}$  acre and less,

give biased estimates of the yield of the whole field.—S. W. Brown.

11102. Patterson, R. E. (*Agric. Expt. Sta., College Station, Texas.*) The use of adjusting factors in the analysis of data with disproportionate subclass numbers. *Jour. Amer. Statist. Assoc.* 41(235): 334-346. 1946.—Coding by means of the equation:  $\bar{X}_{ij} - \bar{X}_j + \bar{X} = \bar{A}_{ij}$ , (where  $\bar{X}_{ij}$  is the unadjusted mean of the  $i$ th subclass in the  $j$ th row or column,  $\bar{A}_{ij}$  is the corresponding adjusted or coded mean,  $\bar{X}_j$  is the mean of the  $j$ th row or column, and  $\bar{X}$  is the grand mean) will eliminate the variance attributable to either of the border effects in a 2-way table designed for analysis of covariance. When applied to a table which is non-orthogonal as a result of disproportionate subclass numbers the removed sum of squares will be too large because of interaction. This deficiency may be recovered by successively readjusting alternately for intercolumn and interrow differences, finally yielding the same result as the method of Brandt and Yates involving the least-squares fitting of constants. When the latter method is applicable, Patterson's method should reduce the labor of computation. One orthogonal and one non-orthogonal example are fully worked out.—L. C. Cole.

11103. Turrell, F. M. (*Citrus Expt. Sta., Riverside, Calif.*) Tables of surfaces and volumes of spheres and of prolate and oblate spheroids and spheroidal coefficients. xxxiii + 153 p. 10 fig. Univ. California Press: Berkeley, Calif., 1946.—Numerical tables of surfaces and volumes of spheres to 3 figures are given for arguments (diameters) of 1 to 15 in. tenths. Numerical tables of surfaces and volumes of prolate and oblate spheroids to 3 figures are given for differences in the major and minor axes of 0.1 to 3 in. tenths, where the arguments (major and minor axes) range from 1 to 15 in. tenths. About 18,000 numerical values are given. The range of the numerical tables is extended by inclusion of 4 brief tables of spheroidal coeffs. (about 400 values) in which

some calculation (using the table of spheres) is required. In using the numerical tables no calculation is required. Designed for obtaining fruit and vegetable surfaces and volumes, the tables greatly reduce the time of calculation of spherical and aspherical objects ranging from balls to wafers or toothpicks. A discussion of errors and examples are included for the use of the tables and interpolation in them. An appendix shows the derivation of formulae used in the calculating of the tables. The volume is indexed and otherwise made up to facilitate its rapid use.—F. M. Turrell.

11104. Wellman, R. H., H. W. Thurston, Jr., and F. R. Whaley. A method of correcting for soil variation in field tests. *Phytopath.* 37(1): 23-24. 1947.—An adjusted value is computed for each half plot based on  $Y$  (field av. plot yield)  $\div y$  (av. plot yield per treatment)  $\times R$  (actual yield per plot). This gives  $G$ , which includes error and soil variation but excludes treatment effect.  $G$  values are computed in field order and a smooth curve constructed through them.  $Y$  is subtracted from the smooth curve at the location of each plot, giving  $c$ ; then  $Y \div (Y + c) \times R$  = adjusted yield. Adjusted yields for half plots are added, then subjected to the usual analysis. The uncorrected error variance was reduced >50% in 1 expt.—Freeman Weiss.

11105. Whelpton, P. K. Reproduction rates adjusted for age, parity, fecundity, and marriage. *Jour. Amer. Statist. Assoc.* 41(236): 501-516. 1946.—A discussion of errors involved in computing reproduction rates from age-specific birth rates. These rates differ from age-specific death rates in that the risk of birth is zero for part of the population in any year and that only women of  $n$  parity order can be exposed to the risk of bearing a child of  $n + 1$  order. Age-parity-fecundity-marriage specific birth rates are recommended for use where adequate population data are available.—L. C. Cole.

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 11292, 12168, 12172, 12173, 12252, 12627)

### MICROSCOPY AND TECHNIQUE

11106. Andrews, F. N. (*Purdue U., Lafayette, Ind.*) A device to aid paraffin embedding. *Stain Tech.* 20(4): 137. 1945.—The flaps of paper boats filled with melted paraffin are rested on the edges of the rack in an ordinary electric refrigerator ice cube tray filled with ice water.—E. R. Noble.

11107. Ashley, Laurence M. (*Coll. Med. Evangelists, Loma Linda, Calif.*) A simple home-made microscope lamp. *Turtlox News* 25(1): 28-29. 1 fig. 1947.—Made from lamp shade hanger, lamp socket, wire coat hanger, and tin can. Frosted blue bulbs are used.—R. W. Dexter.

11108. Cutter, V. M. Jr. (*U. Minnesota, Minneapolis.*) Smear methods for the study of chromosomes in Ascomycetes. *Stain Tech.* 21(4): 129-131. 1946.—Several modifications of the aceto-carminic smear technic used by the author in studies of the meiotic chromosomes of *Neurospora* are outlined. The critical role of the staining soln. is stressed and suggestions are given for preparing a satisfactory carminic soln. The ease and rapidity of this method suggests its use in cytologic work on other Ascomycetes.—Auth. abst.

11109. Gamble, John T. A combination bleaching-clearing agent and its use in the processing of "Spalteholz" preparations. *Stain Tech.* 20(4): 127-128. 1945.—A method is descr. for combining KOH and H<sub>2</sub>O<sub>2</sub> for clearing and bleaching in one soln. small vertebrates for the in-toto prepn. of skeletal material.—E. R. Noble.

11110. Hegre, E. S., and A. D. Brashear. (*Med. Coll. Virginia, Richmond.*) Block-surface staining. *Stain Tech.* 21(4): 161-164. 1946.—A method is described by which the tissue exposed on sectioning a specimen embedded in paraffin can be visualized in situ. The fixed specimen is impregnated with lead acetate, dehydrated in dioxane, infiltrated with paraffin and embedded. Tissues exposed on sectioning are developed by applying to the cut surface of the block a soln. of potassium sulphide in water. Concs. of the reagents used and the time intervals for the procedure

are dependent upon the size of the specimen and upon the degree of contrast required. The method is described as it was applied to the study of a small human fetus in cross section. Representative photographs are included to show the results obtained.—Auth. abst.

11111. Lewis, Louis W. (442 Woodbury Rd., Glendale, Calif.) Method for affixing celloidin sections. *Stain Tech.* 20(4): 138. 1945.—The section to be mounted is removed from 70% alcohol to a slide which has been rubbed with Haupt's adhesive, then blotted with paper, and quickly transferred to a Coplin jar of 50-50 ether-alcohol until celloidin is dissolved.—E. R. Noble.

11112. Lowe, Jeannette. (*Agric. Expt. Sta., New Haven, Conn.*) Root tip smears for maize. *Stain Tech.* 21(4): 127-128. 1946.—Fix in Carnoy's fluid, change to 70% ethanol, then to equal parts HCl and 95% ethanol, to 70% ethanol. Tease free-hand section of root tip in drop of aceto-carminic, add coverglass and press down. Pass slide through flame several times, mount.—E. R. Noble.

11113. Lutman, B. F. (*Agric. Expt. Sta., Burlington, Vt.*) A one-solution tannic acid-iron stain for plant tissue sections. *Stain Tech.* 21(4): 153-160. 1946.—The formula used by the U. S. government for ink for official use was tried as a stain for the *Actinomyces*. This combination is composed of tannic and gallic acids with ferrous sulphate and is acidified with HCl. When used double strength, as suggested for special blackness and permanence, the stain was very successful on sections of potato roots and tubers. It stained the *Actinomyces* hyphae very differentially and was decolorized from all other cell organs.—E. R. Noble.

11114. Meyer, James R. (*U. Tennessee, Knoxville.*) Prefixing with paradichlorobenzene to facilitate chromosome study. *Stain Tech.* 20(4): 121-125. 1945.—A technic was developed which resulted in preps. containing many mitotic divisions with chromosomes well fixed and stained, rod-shaped, and spread throughout the cell. This technic has given good results with guayule (*Parthenium argentatum*), *Crepis*,



*Allium*, *Pisum*, *Lycopersicon*, *Tradescantia*, and other plants. Material is prefixed in a saturated soln. of paradichlorobenzene for 1-4 hours, fixed in 65% acetic acid (or other suitable fixative) for 12-24 hrs., hydrolyzed in 10% HCl for 10-30 min. at 60°C, rinsed in water, transferred to a drop of 45% acetic acid on a slide, and smeared and stained in aceto-orcein. The prepn. may be made permanent by separating slide and cover glass in 1 part glacial acetic acid to 1 part absolute alcohol, putting them in absolute alcohol, and then recombining them with a drop of euparal.—*Auth. abst.*

11115. Salazar, A. L. (U. Porto, Portugal.) A new technique: Tannin-iron II. *Stain Tech.* 21(4): 149-151. 1946.—The technique of tannin-iron II consists of successive mordanting in tannic acid and in iron alum, repeated  $n$  times, with washing in water between each bath. The reaction takes place progressively through the passages resulting in total blackening of the section when the reaction is complete. It colors only proteins, and permits a study of the architecture of the cytoplasm.—*E. R. Noble.*

11116. Stowell, R. E. (Washington U. Sch. Med., St. Louis, Mo.) The specificity of the Feulgen reaction for thymonucleic acid. *Stain Tech.* 21(4): 137-148. 1946.—The results of expts. on the specificity of the Feulgen reaction for thymonucleic acid do not substantiate the observations of Carr. The staining is not localized in the nucleus because of the destruction of cytoplasmic constituents following acid hydrolysis or because of the absorbing power of chromatin, since the cytoplasm and nucleolus can still be stained by numerous dyes. The effects of factors such as the acid hydrolysis and sulfurous acid washing baths upon the cytologic distribution of dye were studied on tissues stained with (1) fuchsin-sulfurous-acid (Feulgen) reagent, (2) fuchsin-sulfurous-acid reagent colorized by the addition of formaldehyde, (3) basic fuchsin in  $N/10$  HCl, and (4) basic fuchsin in dist. water. The evidence for and against the specificity is discussed. In agreement with most other investigators, on the basis of the evidence in the literature as well as these expts., it is concluded that when properly controlled, the Feulgen reaction is relatively specific for thymonucleic acid.—*Auth. abst.*

11117. Wicks, L. F., C. Carruthers, and M. G. Ritchey. (Washington U. Sch. Med., St. Louis, Mo.) The piccolyte resins as microscopic mounting media. *Stain Tech.* 21(4): 121-126. 1946.—A new series of synthetic resins, the "Piccolytes" ( $\beta$ -pinene polymers), is recommended for permanent mounting media in histological work. These resins, which are available with various melting points, are of correct refractive indices, very low acid numbers, are pale, non-yellowing, have good adhesion to glass, and are freely soluble in xylene. They are uniform in characteristics as well as readily available and very cheap.—*Auth. abst.*

11118. Wilson, G. B. (Govt. Bot., Jamaica, B.W.I.) The venetian turpentine mounting medium. *Stain Tech.* 20(4): 133-135. 1945.—As a mounting medium to follow aceto-carmine, the following modification of Zirkle's is suggested: Venetian turpentine, 25 ml.; phenol, 50 ml.; propionic acid, 35 ml.; acetic acid, 10 ml.; water, 20 ml. The technique can be employed with either root-tip or pollen-mother smears, and has been used with quite a variety of plants. It is especially valuable where it is desired to make temporary mounts permanent. The method is simple, and with reasonable care no displacement of marked cells occurs.—*Auth. abst.*

#### LABORATORY APPARATUS AND TECHNIQUE

11119. Bastings, L. (Dominion Physical Lab., Wellington, New Zealand.) A "cold-junction" box for thermocouples. *Jour. Sci. Instruments* 23(6): 132. 2 fig. 1946.—The cold junction is maintained at constant temp. above ambient temp. by immersion in a bath of transformer oil contained in a well in the bulb of an ordinary mercury-toluene thermometer. The thermoregulator, together with a heater which it controls, is housed in an insulating box.—*R. L. Weintraub.*

11120. East, H. G., and H. Kuhn. (Clarendon Lab., Oxford, Eng.) An accurate bellows manometer. *Jour. Sci. Instruments* 23(8): 185. 2 fig. 1946.—Expansion and

contraction of a flexible metal bellows, measured by means of an optical lever, are utilized for determining small pressure differences at any absolute pressure from zero to several atmospheres. The instrument has a rapid response, sensitivity of 0.0005 mm. Hg, and accuracy of 0.0002 of full range.—*R. L. Weintraub.*

11121. Hunt, R. W. G. The measurement of small linear motions by optical methods. *Jour. Sci. Instruments* 23(6): 119-121. 6 fig. 1946.—Two methods are described: one makes use of 2 microscope objectives and depends on lenticular magnification for high sensitivity; the other uses a concave mirror and 2 prism systems, high sensitivity being obtained by means of prismatic magnification.—*R. L. Weintraub.*

11122. McDonald, I. G., and M. O. Pelton. (Shirley Inst., Didsbury, Manchester, Eng.) The design of a quadrant balance. *Jour. Sci. Instruments* 23(8): 186-187. 2 fig. 1946.—Discussion of the theory of the direct reading quadrant-type balance and its application to the design of balances with minimum variation of sensitivity over a given range of load. Description of balances constructed for textile testing purposes.—*R. L. Weintraub.*

11123. Perfect, D. S., and R. M. J. Withers. (Abinger Magnetic Sta., Surrey, Eng.) A photoelectric method of indicating small displacements and of timing a moving body. *Jour. Sci. Instruments* 23(9): 204-207. 4 fig. 1946.—The sharp edge of a small stainless steel prism attached to the moving body is caused to pass across the narrow image of a fixed slit. The 2 reflected components into which the prism divides the incident beam of light fall, respectively, on 2 photocells which form part of a balanced circuit fed with an input of frequency 10 kc/s. For a specific position of the prism relative to the image, the amplified output has a sharp minimum; this may either be detected directly on a cathode-ray oscillograph or be used to trigger an auxiliary circuit which sends an impulse to a chronograph that records the time at which the minimum occurs. The indications of position or of time are virtually independent of the intensity of light or of the direction of motion. A positional sensitivity of 0.05  $\mu$  is attained; the system is stable within this range for at least 3 min. It is stable within a range of 0.15  $\mu$  over a period of a few hrs. The system was primarily designed for determining, with an accuracy of 1 msec., the times when a slowly moving carriage reaches certain positions.—*Auth. abst.*

11124. Preston, J. S. (Nation. Physical Lab., Teddington, Middlesex, Eng.) The specification of a spectral correction filter for photometry with emission photocells. *Jour. Sci. Instruments* 23(9): 211-216. 1946.—An aqueous soln. of cupric chloride, cobalt ammonium sulfate and potassium dichromate is a useful filter for modifying the spectral response of certain types of emission photocells, so as to match the response of the standard (photopic) eye. A table of spectral densities for these solutions permits calculation of the combination required for correction of a given photocell.—*R. L. Weintraub.*

11125. Reimann, A. L. (U. Queensland, Brisbane, Australia.) Coppered-tungsten seals through hard glass. *Jour. Sci. Instruments* 23(6): 121-124. 2 fig. 1946.—For making vacuum-tight seals of split tungsten wire in glass, a process is described for providing the W with a sheath of Cu which flows into and fills any cracks. The surface Cu may be dissolved from the unengaged ends of the wire after sealing.—*R. L. Weintraub.*

11126. Spicer, B. A. A radon "seed" machine. *Jour. Sci. Instruments* 23(9): 207-208. 1 fig. 1946.—Radon-charged glass capillaries are divided into "seeds" by an electrically heated Pt filament in a machine which can be operated by unskilled personnel with a minimum of exposure to irradiation.—*R. L. Weintraub.*

11127. Wearmouth, W. G. Notes on the machining of plastics. *Jour. Sci. Instruments* 23(6): 109-113. 8 fig. 1946.—A summary of information on tools and techniques for turning, drilling, threading, sawing, shaping, and milling various plastics.—*R. L. Weintraub.*

11128. Williams, S. E. A Knudsen absolute manometer. *Jour. Sci. Instruments* 23(7): 144-146. 3 fig. 1946.—A simplified design for the range  $10^{-4}$  to  $<10^{-6}$  mm. mercury.—*R. L. Weintraub.*

## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Late glacial climate, Finland, 11194; Prehistoric tools from E. Prussia, 11222; Renal dwarfism, 11498; Vertebral spinous processes, 11762; Accessory liver, 11797; Blood group and susceptibility to poliomyelitis, 12039; Anat.-path. observations on Okinawans, 12137)

11129. Bassett, David L. Permanent mounts of gross anatomical sections in ethyl methacrylate. *Amer. Jour. Phys. Anthropol.* 4(2): 8. 1946.—An abstract.
11130. Carneiro, J. L. (U. Tucuman, Argentina.) Los grupos sanguíneos de la provincia de Tucuman. *Arch. Farm. y Bioquim. Tucuman* 2(2): 169-179. 1945.—The blood groups of 1000 persons of the Province of Tucuman, Argentina, were studied. Findings show, Group O, 54.5%; A, 31.6%; B, 11.9%; and AB 2%.—E. A. Falco.
11131. Connolly, C. J. The representation of brain fissures on the endocranial casts of anthropoids and man. *Amer. Jour. Phys. Anthropol.* 4(2): 6-7. 1946.—An abstract.
11132. Ewing, J. Franklin. Aurignacian man in Syria. *Amer. Jour. Phys. Anthropol.* 4(2): 4-5. 1946.—Two skeletons were discovered in 1938 in a rock shelter at Ksar 'Akil, near Beirut. They have not yet been extricated from the brecciated matrix, but some preliminary observations are recorded.
11133. Garn, Stanley M. (Harvard U., Cambridge, Mass.) Hair structure related to hair form. *Amer. Jour. Phys. Anthropol.* 4(2): 4. 1946.—An abstract.
11134. Goldstein, Marcus S. (U. S. Publ. Health Serv., Bethesda, Md.) Growth of Mexican infants born in the United States and Mexico. *Amer. Jour. Phys. Anthropol.* 4(2): 6. 1946.—An abstract.
11135. Kaufmann, Hélène, et Marguerite Lobsiger-Dellenbach. (U. Geneva, Switzerland.) Cranes du cimetière de la Madeleine a Lausanne (Suisse), suivi d'un répertoire bibliographique et topographique des documents anthropologiques Vaudois, par Hélène Kaufmann. *Arch. Suisses Anthropol. Gén. Suppl.* 11(1): 1-55. Map, 7 fig. 1945.—The historical museum at Lausanne, Canton of Vaud, has 167 skulls (98 ♂, 69 ♀) from the ancient Madeleine cemetery of the Dominican order (1234-1539 A.D.). Prof. Pittard had previously examd. 796 skulls from the Rhone valley in neighboring cantons of Valois and Savoy. Sauter studied >100 medieval skulls from the vicinity of Lake Geneva. The authors have made complete anthropometric studies of the ancient Lausanne skulls and of many recent Vaud skulls and have compared their measurements with those of Pittard and Sauter. The topographical survey of the documents relating to the anthropology of Vaud lists 68 places where skulls have been found and annotations give significant data and the names of investigators who have described them.
11136. Lasker, Gabriel W. *Torus palatinus*. *Amer. Jour. Phys. Anthropol.* 4(2): 5-6. 1946.—Occurrence of this bony downgrowth along the midline of the hard palate was studied in 280 Chinese, over 300 white Americans, 12 pairs of like-sexed twins and other material. Tori are much more frequent in ♀ than in ♂.
11137. Lewis, Arthur B. (Samuel S. Fels Res. Inst., Yellow Springs, Ohio.) A dental and facial study of triplets. *Amer. Jour. Phys. Anthropol.* 4(2): 8. 1946.—An abstract.
11138. Little, K. L. Some anthropological characteristics of Anglo-Negro children. *Jour. Roy. Anthropol. Inst. Gr. Brit. and Ireland* 73(1/2): 57-73. 1943.—Little studied 460 children from Cardiff and Liverpool, age 5-14 yrs., in 2 groups, Anglo-Negro and "English." They were divided into 231 ♂♂ (114 A-N and 117 Eng.) and 226 ♀♀ (106 A-N and 120 Eng.) 20 measurements, largely cranio-facial, and 4 observations were taken: eye color (Martin chart), hair color (Fischer-Saller), skin color (von Luschan) and teeth. The N parentage was largely ♂; 51% were from W. Africa, 36% from Jamaica and other BWI isles, 13% were born in England. Little used symbols NWW and NNW for more or less N and/or W. "Hybrid" children were taller and heavier, longer-headed, broader-faced, and with greater ext. and int. biob. dimensions. "English" children were broader-headed, with narrower forehead, longer ear, broader jaw. "Hybrids" showed moderate to low variability. Rates of growth were same for both groups. For hair "hybrids" showed in 4/6 of cases dark-brown (UX); "English" showed F-K and L-Q. For eye "hybrids" were mostly brown; "English" were grey to grey-brown. Skin color in "hybrids" was intermediate between White and Negro. "Hybrids" showed less caries (1 of 10) than "English" (1 of 3). "Hybrids" in nose breadth, nose depth, lip thickness, and skin color are intermediate; in hair and eye color they are nearer the Negro norm.—W. M. Krogman.
11139. McCown, T. D. The amputation prosthesis: a new field for dynamical physical anthropology. *Amer. Jour. Phys. Anthropol.* 4(2): 7. 1946.—An abstract.
11140. Manuila, Alexandre, M. R. Sauter, et M. Vestemaneu. (U. Geneva, Switzerland.) Contributions aux études séro-anthropologique. II. Étude de 16,685 correlations entre le groupe sanguin et d'autres caractères morphologiques, examinés en Europe orientale. *Arch. Suisses Anthropol. Gén. Suppl.* 11(2): 47-107. 1945.—The introduction explains the relation of serology to anthropology. The 1st chap. is a résumé of the principal earlier work covering 2 subjects in 7 countries: I. The blood groups and pigmentation in Netherlands, Germany, Brit. Isles, Czechoslovakia, Jews of Morocco, Moroccians, Roumania.—II. The blood groups and anthropometric characteristics of 7 peoples, substituting Poles and Armenians for Brit. Isles and Czechoslovakia. Chap. 2 covers original work on 8 aspects of the subject:—Blood group and 1) pigmentation of the iris, 2) pigmentation of the hair, 3) form of the hair and hairiness, 4) cephalic index, 5) nasal index and form of nose, 6) form of the face, 7) body proportions, 8) musculature.
11141. Montagu, M. F. Ashley. (Hahnemann Med. Coll., Philadelphia, Pa.) Ritual mutilation among primitive peoples. *Ciba Symposia* 8(7): 421-436. Illus. 1946.—This is a survey article of the history and geographic distribution principally of circumcision and excision. The author offers some ideas of racial relationship based on geogr. distribution.—W. M. Krogman.
11142. Moore, T. V., and E. H. Hsü. Factorial analysis of anthropological measurements in psychotic patients. *Human Biol.* 18(3): 133-157. 1946.—The basis of the study was a table of intercorrelations between anthropological measurements. This table was subjected to a factorial analysis by Thurstone's technique. The factorial analysis revealed at least 5 meaningful factors. These factors and the most significant measures by which they are detd. are: Factor A: A linear factor, best detd. by: Stature, span, na-pr, nose L, ear L, hand L, arm L, leg L. Factor B: A magnitude factor, best detd. by: Sitting ht. Factor C: A lateral factor, best detd. by: Calf girth, forearm girth, circ. of neck. Factor D: A circumferential or "thickness of the trunk" factor, best detd. by: Circ. of the chest, waist girth. Factor E: A factor that has to do with the size of the head, best detd. by palpebral breadth. It is suggested that these factors have a true physiological meaning and might be related to specific hormones. The "thickness of the trunk" factor was found to differentiate the non-paranoid schizophrenics from the paranoid schizophrenics, and the non-paranoid schizophrenics (e.g., the catatonics) from the manic-depressives. The factorial analysis of the anthropological measurements thus points to the existence of a biological difference between patients who suffer from certain psychotic conditions.—Authors.
11143. Müller, Reinhold F. G. Eine Konstitutionslehre der altindischen Medizin. [Constitution in ancient Indian medicine.] *Zeitschr. Rassenphysiol.* 12: 9-72. 1941.
11144. Novak, E. (Johns Hopkins Med. Sch., Baltimore, Md.) The constitutional type of female precocious puberty with a report of 9 cases. *Amer. Jour. Obstet. and Gynecol.* 47(1): 20-41. 11 fig. 1944.—Tumors of certain endocrine glands and various cerebral lesions are often reported as causes of prec. puberty in the ♀ but there has been little discussion of the const. type of this syndrome, probably more frequent than any other. In the latter type no tumor or lesion is demonstrable, nor does it manifest itself in the later course of the patient. The abnormally early puberty

is identical with normal puberty except for the early age. 9 cases are reported, the ages varying from 15 mos. to 7½ yrs. The only plausible explanation for the otherwise normal pubertal mechanism seems to be on a chromosomal or genic basis, so the designation "constitutional" seems appropriate. Cases of this type are more common than those due to granulosa cell tumors, which are usually suspected in precoc. puberty. In the absence of any enlargement of the ovary it is wiser to refrain from exploratory operation and the patient should be periodically examined. Microscopic examination of ovaries in several such cases indicates that, unlike the granulosa cell tumor cases, those of const. type not only menstruate but also ovulate at abnormally early ages. This would explain the occurrence of pregnancy at extremely early ages, as in the remarkable case reported from Lima, Peru, 1940, of a full term pregnancy in a child of 5 yrs. and 8 mos. The most important practical points in management of these cases are the avoidance of a sense of inferiority or abnormality in the mind of the child and the protection against possibility of insemination.—B. C. Russum.

11145. Sandoval S., L., C. Henckel, and L. Givovich.

The blood groups, subgroups, and Rh factor of the Mapuche Indians of the Province of Cautin, Chile. *Blood. Jour. Hematol.* 1(6): 555-559. 1946.—The blood groups in 205 Mapuche Indians from Cautin, Chile, showed Group O, 86.8%; A<sub>1</sub> 8.3%; A<sub>2</sub> 0.5%; B 3.4%; AB 1%. The standard Rh factor was noted in 98.6%.—R. Isaacs.

11146. Sauter, Marc R. (U. Geneva, Switzerland.) Les races brachycéphales du Proche-Orient, des origines a nos jours. (Avec un essai de bibliographie concernant l'anthropologie du Proche-Orient). *Arch. Suisses Anthropol. Gén.* 11(1): 68-131. 1945.—An exhaustive monograph on the origin of the brachycephalous populations of the Near-East based on a study of 315 publications.

11147. Singh, I., (Mrs.) I. Singh, and M. C. Muthana. (Dow Med. Coll., Karachi, India.) Racial characteristics. *Current Sci.* 15(8): 235. 6 fig. 1946.—Racial differences may be attributable to physiological adaptation of human tissues.—S. W. Brown.

11148. Wetzel, Norman C. The grid technique of evaluating growth and development in infants and children. *Amer. Jour. Phys. Anthropol.* 4(2): 7-8. 1946.—An abstract.

## ETHNOBIOLOGY

W. M. KROGMAN, *Editor*

(See also B. A. 21(2): Forest communities due to activity of prehistoric man, U. S., 2723; Bromus mango as food plant, Chile, 4122; (4): Origin of oats, 9763; of sweet potato in Oceania, 10013; of the potato, 10027; Fish and man's activity, USSR., 10767; and in this issue Prehistoric tools from E. Prussia, 11222; Animals from pre-Columbian deposits, Martinique, 13142)

11149. Anderson, Edgar. What is Zea mays?—A report of progress. *Chron. Bot.* 9(2/3): 88-92. 1945.—Collaboration of agronomists, geneticists, archaeologists, geographers, anthropologists and taxonomists has resulted in the accumulation of much valuable information concerning "the physical anthropology of the maize plant." Similar studies might well be undertaken of other crop plants.—E. L. Core.

11150. Cutler, Hugh C. (Harvard U., Cambridge, Mass.) Races of maize in South America. *Bot. Mus. Leaf. Harvard Univ.* 12(8): 257-291. 4 pl., 4 fig. 1946.—A study was made of the composition and distribution of S. American maize and related grasses in order to find further evidence concerning the origin and dispersal of maize. Collections were made and studied in S. America and checked by growing plants in the same or similar localities. Collections in the museums of various institutions were also studied. Despite the great diversity of maize, many of the vars. cultivated to-day were found to have remained constant over a long period of time. In the structure of the ear 3 tendencies appeared in S. American maize: a *Tripsacoid* influence from hybridization with *Tripsacum*, resulting in compression and condensation, with hardening of the parts, straightening of rows, reduction in row number, shortening of pedicels and sinking of parts into pits or alveoli on the rachis; an *Andropogonoid* tendency toward freely branched parts, long pedicels and fibrous, as opposed to brittle parts, reminiscent of some *Andropogon* spp.; and a fasciated tendency toward a shortening of the longitudinal axis with continued development of the parts.

The general characteristics of maize plants and their parts are described in detail. The characteristics of some of the major S. American races, Coroica, Guarani, Coastal Tropical Flint, Altiplano, Uchokillo, Valle and Cuzco, are outlined.—L. T. Richardson.

11151. Lais, Robert. Neolithische Holzkohlen der wilden Weinrebe aus dem Gebiet des Oberrheines. [Neolithic charcoals of the wild Vitis from the region of the upper Rhine.] *Aus der Heimat* 55: 42-43. 1942.

11152. Speck, Frank G. Ethnoherpetology of the Catawba and Cherokee Indians. *Jour. Washington Acad. Sci.* 36(10): 355-360. 1946.—An annotated list of 17 spp. of snakes in the Catawba language of S. Carolina, and 18 in the speech of the Eastern Cherokee of N. Carolina. Six turtle names, 4 lizard and 3 frog names are given in Catawba. Analyses and folk interpretations are included.—F. G. Speck.

11153. Standley, Paul C. Food plants of the Indians of the Guatemalan highlands. *Jour. Arnold Arboretum* 27(4): 395-400. 1946.—The Guatemalan Indians are very conservative and have probably changed their customs very little as a result of their exposure to Iberian culture. Their diet contains little meat, but the climate is such that a great variety of vegetable products can be grown. The staple food plants are maize and beans. Secondary vegetables are tomatoes and pumpkins; the uses of the chayote, the pacaya, izote, chaya, and other locally used plants are discussed.—A. C. Smith.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; and: Hereditary differential in learning, chicks, 11062; Reproduction rates adjusted for age, parity, fecundity, and marriage, 11105; Renal dwarfism, 11498; Trends in heart disease, 11571; Alcoholism, 11584; Trends in age distribution of childhood diseases, 11625; Congenital malformations in infant following rubella during pregnancy, 11628; Physical defects in relation to age, sex, race and socio-economic status, 11635; The Rh factor in feeble-mindedness, 11932; Constitution and susceptibility to common cold, 12095; Decline in syphilis mortality, U. S., 12098; Negro mortality, U. S., 12131)

### POPULATION, FERTILITY, VITAL STATISTICS

11154. Jokl, E. Report of activities of the Medical Research Committee of the National Advisory Council for Physical Education. (Obtainable from: Librarian, Union Education Department, Church Square, Pretoria, S. Africa.) *Manpower* 4(2): 1-58. 1946.—A concise and well organized report of research on medical problems of physical education conducted during the past decade. Part I reports a group of studies intended to establish standard grids of growth, physi-

cal efficiency and health. Part II summarizes 3 investigations of comparative anthropometry, viz., on the physique of American, Canadian, English and South African school children; on women and men in sport; and on training and physique of adolescent boys. Part III is an account of investigations in which a number of inter-relations of health, growth and efficiency have been analyzed, viz., body wt. as determiner of physical efficiency; good and bad eaters; effect of mid-day meal upon physical efficiency of school



children; skin manifestations of malnutrition, scabies and impetigo; disease and physical efficiency; vitamin C deficiency and physical efficiency; intelligence, scholastic performances, growth, health and physical efficiency; height, wt. and body index; menarche, growth and physical efficiency. Part IV is a brief summary of evidence pertaining to the conservation of human resources. Part V is a discussion of clinical observations regarding the interdependence between fitness and health, namely athlete's sickness; heart and sport; and other case studies. Part VI deals with 4 theoretical concepts, viz., specificity of fitness; medical theory of gymnastics; physique and character; and adaptation energy. Some of the material reviewed in this report had originally been published in various periodicals.—*B. M. Clark.*

11155. Sircar, S. N. (*Tata Iron and Steel Co., Jamshedpur, India.*) The future coal policy of India. *Sci. and Culture* 11(11): 584-591. 1946.—In an article mostly concerned with reserves, location, mining, use, and conservation of coal in India, appears a section on human biology. Indian laborers who mine coal usually own some land and prefer agriculture; the labor supply is adequate only following crop failure. Distance of the mine from the laborer's land, low wages, and conditions at the mine (unhealthy and dangerous work, unpleasant and unsanitary living conditions, and lack of schools and recreation) discourage the development of a group of permanent and skilled miners. Plans for the future of India's coal mines must consider the human factors; at present the per person per day output in the U. S. is 15 times that of India.—*C. A. Reed.*

11156. Anonymous. Longevity at record high in industrial population. *Statist. Bull. Metropolitan Life Insurance Co.* 27(8): 1-3. 1946.—With mortality conditions of 1945 (excluding deaths from enemy action), the expectation of life at birth of the Company's industrial policyholders would be 64.95. Two factors have contributed materially toward bringing about an increase of  $4\frac{3}{4}$  yrs. in the last decade: the generally raised standard of living resulting from full employment at relatively high wages, and the widespread use of sulfa drugs and penicillin in the treatment of a large variety of infections.—*P. K. Whelpton.*

11157. Anonymous. Health problems of an aging population. *Statist. Bull. Metropolitan Life Insurance Co.* 27(12): 6-8. 1946.—Activities of the public health program must be concentrated more and more on diseases and conditions which affect the older ages. This includes 4 of the 5 most important causes of death (heart disease, cancer, cerebral hemorrhage, and nephritis), and 2 of the 2d 5 (diabetes and arteriosclerosis).—*P. K. Whelpton.*

#### BEHAVIOR

11158. Duffy, Elizabeth (*U. No. Carolina, Chapel Hill*), and O. L. Lacey. (*U. Alabama, University*.) Adaptation in energy mobilization: Changes in general level of palmar skin conductance. *Jour. Exptl. Psych.* 36(5): 437-452. 1 fig. 1946.—Palmar skin conductance has with justification been regarded as an index of degree of energy mobilization. Measurement of the general level of palmar conductance was, therefore, employed as a means of investigating adaptation effects in energy mobilization during successive rest periods and successive repetitions of a task. The task employed was that of making auditory discriminations. A series of tones, varying in intensity from zero decibels to an intensity just below the subject's limen, was presented at regular intervals to 10 subjects, 4 times during an exptl. session, on 3 consecutive days at the same hr. The subject responded by a tap of the foot whenever a tone was heard. Palmar resistance was recorded at 15-sec. intervals, during the stimulus series and during the rest period preceding the exptl. session. Resistance measures were translated into the reciprocal value-conductance. Decreasing conductance, indicating a decrease in energy mobilization, was found: 1) In the course of the rest period preceding the presentation of stimuli; 2) from series to series during the 4 repetitions of the series of auditory discriminations which occurred in a single exptl. session; 3) from day to day throughout the 3-day period of the experiment, during both (1) the rest period, and (2) auditory discriminations. The differences found are statistically significant. Adaptation effects in energy mobilization are thus shown to occur upon the repetition of a stimulus situation within a given exptl. session and from day to day. The

phenomenon is similar to the well recognized decrease in use-less overt movements sometimes plotted as a "learning curve". The internal processes of energy mobilization, like the overt responses of the individual, show increasing adaptation to the situation—or "learning".—*Elizabeth Duffy.*

11159. Jones, Maxwell, and Veronica Mellersh. A comparison of the exercise response in anxiety states and normal controls. *Psychosom. Med.* 8(3): 180-187. 1946.—20 healthy men and 10 patients with a characteristic history of effort syndrome (E. S.) and 10 patients with anxiety states and somatic anxiety symptoms were compared in their reaction to exercise.  $O_2$  consumption and the blood lactate after exercise were detd. As a standard exercise, a bicycle ergometer was used; pedalling at 42 r.p.m. with the friction of the brake band being equivalent to a wt. of 9 lb., and the subject doing 6,750 ft.-pounds of work per min. for 5 min. For measuring the  $O_2$  consumption, Douglas bags were used, and a sample from each bag was withdrawn through a Brodie gas sampler. Duplicate samples from each gas sampler were analyzed in a Haldane gas analyzer. The results of these investigations are that the anxiety states as well as the effort syndromes had a significantly poor exercise response compared with the normal controls as far as the  $O_2$  uptake, lactate rise and pulse area are concerned. However, there was no evidence of deficient ventilation.—*Felix Deutsch.*

11160. Jones, Maxwell, and R. Scarisbrick. The effect of exercise on soldiers with neurocirculatory asthenia. *Psychosom. Med.* 8(3): 188-192. 1946.—The term "effort syndrome" (E. S.) as used here refers to a relatively excessive response to effort as manifested by breathlessness, palpitation and subjective feeling of fatigue on even mild exercise, along with excessive vegetative lability on emotional excitement. 35 patients with E.S. and 35 controls were used for this study. For a standard exercise, a bicycle ergometer was used. A lactate detn. was done, and the pulse rate was determined. The results of this investigation show that 25 of the "constitutional" E.S. patients showed a mean blood lactate rise of 28.9 mg. % = 6.14 s.d. after standard exercise on a bicycle ergometer. The corresponding figure for 35 normal controls was 21.1 mg. % = 5.89 s.d. which is significantly different. Ten psychogenically produced E.S. patients did not show a significantly different lactate rise compared with the controls. When worked to exhaustion point, 20 normal controls showed a mean blood lactate rise of 78 mg. % = 8.15 s.d. 20 E.S. patients gave a mean blood lactate rise of 50.2 mg. % = 5.74 s.d.—*Felix Deutsch.*

#### BEHAVIOR—SPEECH DISORDERS

11161. Anderson, Jeanette O. (*Louisiana State U., University.*) Is there a word for aphasia? *Quart. Jour. Speech* 32(4): 485-489. 1946.—No satisfactory definition of aphasia exists. A working concept defines aphasia as a basic disorder of symbolization that may exhibit any combination of many aphasic manifestations. These manifestations may be classified as expressive, receptive, associative, mixed. A crucial issue in the retraining of aphasics in either children or adults is the possession by the aphasic of an actual, literal word received and/or produced by the individual who has been deprived prenatally, natively or post-natively of "propositional speech." There are many approaches to speech learning: visual, auditory, kinesthetic, etc. The cortex appears to function as a unit and recovery in these cases appears to be the result of reorganization of the entire central nervous system. Aphasics may, therefore, progress if (1) there is no progressive destruction of brain tissue; (2) there is no previous history of inability to learn language for other reasons than the aphasia; (3) if the patient has attempted spontaneously to communicate; (4) if regular skilled daily speech training is adapted to each patient's abilities and linguistic residues and incorporated into his way of life.—*M. F. Palmer.*

11162. Bangs, Jack L., D. M. Lierle, and C. R. Strother. (*State U. Iowa, Iowa City.*) Speech after laryngectomy. *Jour. Speech Disorders* 11(3): 171-176. 1946.—An article covering the use of the artificial larynx, esophageal speech and the electrically driven voice box and explaining to patients about to undergo laryngectomy what they may expect relative to the recovery of voice functions after the operation.—*M. F. Palmer.*

11163. Beebe, Helen Hulick, and Shulamith Kastein. (*Mt. Sinai Hosp., Brooklyn, N. Y.*) Psychogenesis in inter-

dental sigmatism. *Jour. Speech Disorders* 11(3): 191-192. 1946.—Using a series of 254 untreated cases, from Froeschels clinics, of interdentality, the protrusion of the tongue increased with backward bending of the head in 167 cases. The authors summarized psychogenesis in interdental sigmatism as follows: (1) Normal s changes into a palatal one when the head is bent backward suddenly. (2) In the great majority of cases with interdental s the tongue resists this slipping backward, a fact which seems to prove the psychogenesis of interdental lisping (as well as multiple interdentality). (3) It is not the feeling of touch which prevents the tongue from slipping backward, as proved by testing the normal th sound.—M. F. Palmer.

11164. Clark, Ruth Millburn. (U. Denver, Colo.) Group application of the Thematic Apperception Test. *Quart. Jour. Speech* 32(3): 343-349. 1946.—50 students, 12 women and 38 males, members of a beginning speech class, University of Southern California, age range from 16-23 years, the average being 19.9, were given a group projection test constructed from an analysis of 852 stories from the Thematic Apperception Test, secured from subjects in several different localities and from different occupational groups. All tests were conducted in the projection room of the cinema department, University of Southern California. Transparencies of the pictures of the Thematic Apperception Test were projected on the screen, three minutes being allowed for each picture. Twenty-five students took the tests each time they were administered. The standard Thematic Apperception Test was compared with group perception projection. The results of this projection were compared with the individual clinical device of the Thematic Apperception Test. Conclusions were as follows: 1) There is a substantial relationship between the Thematic Apperception Test and the group perception test in four of the five categories used in analysis. 2) There is a much higher relationship between the two tests when the clinical test is administered first. 3) The group projection method is not identical with the clinical method. 4) The group projection test does not indicate the needs so accurately as it does some of the other categories. 5) The group projection test most nearly approaches the Thematic Apperception Test in diagnosing the ending and the adequacy of the leading character. 6) The group projection test could be employed very effectively as a screening device. 7) The group projection method merits further investigation.—M. F. Palmer.

11165. Doerfler, Leo, and Kenneth Stewart. (Deshon Gen. Hosp., Butler, Pa.) Malingering and psychogenic deafness. *Jour. Speech Disorders* 11(3): 181-186. 1946.—Four measurements are made in the D-S Test. They are: (1) the speech reception threshold, (2) the noise perception threshold, (3) the noise interference level, and (4) the repeat speech reception threshold. The relationships between these measurements are used as the basis for isolating cases of psychological deafness. One or more of the following conditions raise the suspicion that the patient exhibits non-organic loss: 1) When speech reception is inhibited by a noise interference level less intense than the speech presentation level; 2) when the noise perception threshold is poorer than the speech reception threshold; and 3) when there is sharp discrepancy between the 2 speech-reception thresholds. Variations of the techniques presented have been used successfully. Even more definition can be achieved by interpreting the D-S Test in conjunction with an associated audiogram and a medical history. Treatment of psychogenic losses encountered at Deshon General Hospital has become more precise and rapid since the D-S Test was incorporated as a clinical routine. Basically, the D-S Test determines four measurements of audition. These are: Speech-reception threshold; noise-interference level; noise-perception threshold; and a repeat threshold on speech reception. A continuous series of spondee is spoken 5 db above the speech reception threshold. Simultaneously, the masking noise is introduced and then gradually increased. This procedure is continued until the masking noise reaches a level where it inhibits speech reception and prevents repetition of the words by the patient.—M. F. Palmer.

11166. Irwin, Ruth Beckey. (Ohio State Dept. Educ., Columbus.) Speech comes to a five year old boy. *Jour. Speech Disorders* 11(3): 197-203. 1946.—♂ five years old, apparently normal physically and mentally did not speak

except for the word "mama", using grunts and gestures for communicating ideas. Mother was extremely nervous during child's early life. Parents and grandparents discussed the boy's inability to talk in his presence. Child's needs were anticipated by associates. Bribes, ridicule, praise and punishment had been used by the mother on the child. For several weeks no attempt was made to secure speech responses, play only was given. A "Charley McCarthy" doll was used while confidence was developed. Blowing exercises were brought in. Mother was instructed not to pay attention to his grunts and speech. Constant reward was used as phonetic drill was begun and successful efforts in speech were attempted. After eight months he took a Stanford-Binet intelligence test and made a score of 106, and, at the last session, eight months after the first trip to speech office he was talking spontaneously.—M. F. Palmer.

11167. Longerick, Edward Burt, and Mary Coates Longerick. French-English speech terminology. *Jour. Speech Disorders* 11(3): 193-196. 1946.—Brief French-English logopedic vocabulary as employed by English writers in the present day field of logopedics.—M. F. Palmer.

11168. Peacher, William G. (McGuire Gen. Hosp., Richmond, Va.) Speech disorders in World War II. V. Organization of a speech clinic in an army general hospital. *Jour. Speech Disorders* 11(3): 233-239. 1946.—Special units in an army general hospital that serve efficiently will depend upon the following factors: An interested neurologist or neurosurgeon; a well-trained supporting medical staff; properly qualified speech pathologist, psychologist, occupational and physical therapists; a satisfactory, workable, yet simple, classification to include dysphasia, dysarthria, dysphemia, dysphonia, and dyslalia; methods of examination must be sufficiently graded and standardized for all individual needs, to allow for a wide variety of performance, to compare results and to aid in determining prognosis; adequate equipment and laboratory facilities must be available; detailed and frequent records must be maintained; centralization of all patients on one ward with strategic location of all associated therapies; specific speech therapy must be coordinated with a well-functioning daily reconditioning program.—M. F. Palmer.

11169. Platt, James H. Myasthenia laryngis: A case report. *Jour. Speech Disorders* 11(3): 187-188. 1946.—Report of a case of myasthenia laryngis and the techniques used. Patient was first put on an unstrained whisper, then a program of progressive relaxation was undertaken, then training in diaphragmatic breathing. Rolling the head from side to side and humming exercises were given. The humming exercise consisted of humming at a comfortable pitch for five minutes every waking hour over a period of 6 weeks. When tone initiation became consistently smooth, simple monosyllabic words containing medial vowel sounds were introduced into the exercises. One word was spoken on each expiration of breath, with a prolongation of the vowel sound. Then short sentences were read in chant and later with slight pitch and volume variations. The patient has been cautioned against overuse and strain of the voice. Case is at present improving.—M. F. Palmer.

11170. Platt, James H. Bibliography: Obturators and artificial vela. *Jour. Speech Disorders* 11(3): 189-190. 1946.

11171. Welsh, Alice M. (U. Minnesota, Minneapolis.) Linguistic problems of deafened veterans returning to the universities. *Quart. Jour. Speech* 32(3): 340-342. 1946.—1330 deafened veterans enrolled at the University of Minnesota beginning with the fall quarter of 1946. Speech clinics have the responsibility of locating these veterans since they tend to develop a policy of isolation. Although thousands of hearing losses were detected and treated in Government hospitals, deficiencies of a progressive or permanent nature will be the responsibility of speech clinics for years to come. At the University of Minnesota an extensive counseling program has been established to enable veterans to readjust to civilian life with greater ease. The usual veteran is concerned with his own deteriorating speech and loss of his ability to comprehend. This handicaps him greatly in college activities. An aural rehabilitation program for deafened veterans must provide classes in speech reading, facilities for the correction and prevention of articulatory and phonatory deterioration, recommendations when the need for hearing

aid has been indicated, physical and psychological counseling concerning social, vocation and academic problems. Medical consultation is advisable. Often the audiogram alone does not indicate accurately or definitely the degree of difficulty the individual will have in hearing or imitating speech. The hearing aid is the greatest single therapeutic aid but speech training is usually necessary, even when the aid has been fitted. The small amount of training given in the special Government centers in lip-reading and speech reading and in speech has made many veterans desire to continue this work. Most deafened veterans are eager to take advantage of all available services of the University. The speech pathologist must demonstrate to the dubious ones the need for objectivity and early rehabilitation.—*M. F. Palmer.*

#### ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

11172. Baird, Edward G. (*Yale U., New Haven, Conn.*) The alcohol problem and the law. III. The beginnings of the alcoholic-beverage control laws in America. *Quart. Jour. Stud. Alcohol* 7(2): 271-296. 1946.

11173. Durfee, Charles H. (*Rocky Meadows Farm, Wakefield, R. I.*) Some practical observations on the treatment of problem drinkers. *Quart. Jour. Stud. Alcohol* 7(2): 228-239. 1946.—The effect of an individual's drinking, rather than the quantity, determines whether he is a problem drinker and requires help. Problem drinking may be a manifestation of personality maladjustment but dependence on alcohol may develop in a seemingly well-organized personality through the process of psychological habituation. The prognosis is most favorable where there is insight and genuine desire for help together with a history of purposeful living. It is more favorable in older men than in younger ones, more favorable in men than in women. Reeducation and rehabilitation succeed best in a free rather than in a restricted environment. As a tapering-off drug, alcohol is favored over other drugs. A problem drinker can avoid difficulties only by remaining totally abstinent but he can learn to live and enjoy life without alcohol.—*C. H. Durfee.*

11174. Riley, John W. Jr., and Charles F. Marden. (*Rutgers U., New Brunswick, N. J.*) The medical profession and the problem of alcoholism. A cross-section survey of New Jersey physicians made for the New Jersey Commission on alcoholism and promotion of temperance. *Quart. Jour. Stud. Alcohol* 7(2): 240-270. 1946.—A survey was made to obtain a definitive picture of the attitude of New Jersey physicians as a group toward problems of alcoholism. Replies to a standardized questionnaire were obtained through personal interviews from a balanced sample of all New Jersey physicians. Results showed that a large proportion of the estimated total of 29,000 chronic alcoholics in New Jersey are seen and recognized as alcoholics by doctors. Alcoholic patients receive largely only palliative treatment and physical reconditioning. Doctors find alcoholic patients particularly difficult to handle. Doctors consider alcoholism a medical problem but recognize its psycho-social aspects and believe strongly that non-medical personnel have a role in the total therapy. Doctors recognize that much more hope now exists than formerly for successful rehabilitation of alcoholics if more facilities are provided. More clinical and hospital facilities specially designed for alcoholics are favored. Alcoholism is considered a public health problem in which the State should take the initiative. On the preventive side the doctors strongly favor more public education on alcoholism.—*C. F. Marden.*

11175. Tiebout, Harry M. (*Blythwood Sanitarium, Greenwich, Conn.*) Psychology and treatment of alcoholism. *Quart. Jour. Stud. Alcohol* 7(2): 214-227. 1946.—Based on a study of some 250 alcoholic patients, a concept is introduced of a barrier or shell surrounding the inner Self of alcoholics which obstructs free interchange between the world of the Self and the outer world. Support for this concept is derived from (1) a study of release phenomena appearing during the course of sprees, (2) remarks and dreams of patients, and (3) a peculiar clinical phenomenon which produces in patients the sensation of being exposed. In the strategy of treatment the therapist must remain constantly alert to the existence of this barrier and focus his initial attention upon its penetration in order to establish a working relationship be-

tween therapist and the patient's feelings. Throughout treatment the therapist must face possible interruption of this relationship because for one reason or another the barrier has closed off again. Watching the barrier, the therapist is guided by 3 basic principles in technique: (1) The patient must suffer or feel anxiety about himself and his condition. (2) It is the impersonal pressures of reality which activate suffering. (3) The therapist's first and immediate task is to overcome the patient's refusal, unwillingness or inability to sense these pressures of reality. A case illustrating application of these principles is presented.—*H. M. Tiebout.*

#### MISCELLANEOUS

11176. Jaime Sanchez, Luis. *Psiquiatria, responsabilidad, y delincuencia.* *Rev. Med. Legal Columbia* 5(29/30): 66-88. 1943.—A general discussion is given of the applications of psychiatry in determining criminal responsibility and the like.—*W. C. Tobie.*

11177. Moore, Elon H. (*U. Oregon, Eugene.*) Preparation for retirement. *Jour. Gerontol.* 1(2): 202-212. 1946.—The time of retirement may become a condition of fulfillment and not decay, the days retaining meaning and value for the individual. Retirement can mean many things to many different people. For some it may involve complete withdrawal from productive activity, but retirement to some active interest is more conducive to mental and physical health and can be enjoyed by millions who cannot survive in idleness. The coming of both public and private aid will help millions in realizing plans for retirement. Furthermore, we now have more competitors for jobs and fewer dependent obligations per worker due to the extension of length of life, a declining birth rate, and a decrease in immigration. From this it may follow that movement toward earlier dismissal of the aging may increase, and a worker may find himself involuntarily retired before the age of sixty. Personal influences, such as freedom from routine duties to follow new patterns and interests, reduced comrade relations, and the decrease in status, energy, and health may foster retirement. Preparation for successful retirement begins early in life and how it is accepted depends upon previous experience and reaction. Forty should prepare for 60 just as 20 does for 40.—*E. H. Moore.*

11178. Uribe Cualla, Guillermo. *Importancia del estudio de la personalidad del delincuente.* *Rev. Med. Legal Columbia* 5(27/28): 3-28. 1942.—A general discussion is given on physical, endocrinological, and psychological methods applied in the study of delinquents, with extracts from the criminal laws of Columbia.—*W. C. Tobie.*

11179. Uribe Cualla, Guillermo. *La medicina legal y sus proyecciones actuales en la sociedad y en la justicia.* *Rev. Med. Legal Columbia* 5(27/28): 42-56. 1942.—A very general discussion is given.—*W. C. Tobie.*

11180. Wilson, Elizabeth W. German health insurance. The evolution of a bureaucracy. *Jour. Gerontol.* 1(2): 237-251. 1946.—In prewar Germany the 3 existing health insurance systems cost about 10% of the country's total wage bill. These were health insurance, invalidity insurance, and workmen's compensation insurance. The German attitude viewed old age as merely one form of permanent invalidism, and their system is important because 39 other nations heeded their experience in implementing their own systems. Of the 10%, 4% was paid by the workers, 5% by employers, and 1% by the government. About half of this money was paid out in cash benefits, and the rest was spent on medical benefits and administrative costs. Did the health of the German people improve because of this program? Authorities disagreed, but statistics show that those claiming benefits increased by 40% and the duration of claims by almost 100% during the first 45 yrs. of the program. The German physicians suffered from the system because they were no longer free, self-reliant members of a profession but semi-official governmental agents. Many doctors became excellent politicians rather than distinguished members of the medical profession. The entire program became so powerful because of its large membership and great financial resources that it developed into a Frankenstein monster in the Nazi Bureaucracy and helped destroy the freedom of the German workers.—*Authors.*



## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Gene-controlled audiogenic seizures, mice, 11056; Hereditary differential in learning, chicks, 11062; California ground squirrel, 11273; Eating habits of rats, hypothalamic lesions as affecting, 11715; Relation of chem. structure to response of blowflies to aliphatic acids, 12819; Blowfly rejection thresholds for aliphatic alcohols, 12820; Spider webs, 13037; Behavior of wireworms, 13048, 13049; Birds and human habitats, 13183; Gliding flight in birds, 13205; Display in bird, 13206)

11181. Beeman, Elizabeth A. (*U. Chicago, Ill.*) Male hormone as a cause of aggressive behavior in male mice. *Anat. Rec.* 96(4): 75-76. 1946.—An abstract.

11182. Collias, Nicholas. (*U. Chicago, Ill.*) Some experiments on broody behavior in fowl and pigeon. *Anat. Rec.* 96(4): 76. 1946.—An abstract.

11183. Douglass, Marjorie B. (*U. Chicago, Ill.*) Some evidences of a dominance-subordinance relationship among lobsters, *Homarus americanus*. *Anat. Rec.* 96(4): 57. 1946.—An abstract.

11184. Douglass, Marjorie B. (*U. Chicago, Ill.*) Interspecies relationships between certain crustaceans. *Anat. Rec.* 96(4): 57-58. 1946.—An abstract.

11185. Folk, G. Edgar Jr. (*Harvard U., Cambridge, Mass.*) The recording of the feeding and running activity of rodents. *Anat. Rec.* 96(4): 60. 1946.—An abstract.

11186. Hebb, D. O. On the nature of fear. *Psychol. Rev.* 53(5): 259-276. 1946.—Controlled observation of chimpanzee fear responses to selected stimuli, here reported, seem to indicate that fear originates in the disruption of temporally and spatially organized cerebral activities. Fear is distinguished from other emotions by the fact that cerebral

equilibrium is restored by flight. Sources of fear are conflict, sensory deficit, or constitutional change.—*S. S. Marzolf.*

11187. Macht, David I., and Marion C. Insley. (*Sinai Hosp., Baltimore, Md.*) Effect of pemphigus serum on the behavior of rats. *Proc. Soc. Exptl. Biol. and Med.* 63(2): 281-284. 1946.—The neuro-muscular responses and general behavior of white rats were studied: a) in a circular maze, b) on animals trained to walk on a tight horizontal rope, c) on rats trained to climb a tight vertical rope. Injns. of small quantities of pemphigus sera produced a marked depression of performance in all 3 tests; while control expts. with normal sera had no effect. Pemphigus is not a purely external skin disease, but is a systemic disease with dermatological manifestation, produced by toxic substances in the blood which can be demonstrated by the author's phyto-pharmacological technique.—*Authors.*

11188. Scott, J. P., and Jeannie C. Stewart. Lack of correlation between leadership and dominance in a flock of goats. *Anat. Rec.* 96(4): 56-57. 1946.—An abstract.

11189. Vogel, Howard H. Jr. (*Wabash Coll., Crawfordsville, Ind.*) Allelomimetic behavior and competition in dogs. *Anat. Rec.* 96(4): 56. 1946.—An abstract.



greater variability on the east coasts stand out conspicuously. Monthly rainfall has an unsymmetrical distribution, occasionally very wet months compensating for numerous months with moderately light falls. In a group of records with a variability of the order of 70%, the rainfall mode (the most likely value) was found to be only 18% of the av. and the median 74%, i.e., half the rainfalls were below 74% of the average. The frequencies of occurrences of % rainfalls of different magnitude arranged according to the degree of the variability are summarized in tabular form. A typical station experiences > 6 successive months with rainfall below average 4 times in 30 yrs. and with rainfall above average about once. One of the most notable occurrences was the period of 16 months from June, 1923, at Oamaru, when the rainfall was 49% below av. Cuvier Island had a run of 15 wet months from March, 1916, with an aggregate rainfall 66% in excess of the av. for the period. There is evidence that there is a tendency toward persistence of type, the order of the effect being indicated by the average probability of a dry month; this is 54% if the past month was wet, but increases to 59% if the past one was dry.—*Auth. summ.*

11197. Steelwaag, F. Die Einwirkung schwankender Freilandtemperaturen auf Insekten. *Anz. Schädlingsk.* 16 (10): 109-113. 2 fig. 1940.—Newly-laid eggs of the olethreutid grape pest, *Polychrosis botrana*, produced in an insectary, were placed in a variety of shaded sites in the field. Complete air temp. records were kept at each site by means of a recording thermograph until time of hatching. Average temps. were calculated by dividing the sum of mid-hourly temps. by the number of hours in the day and this dividend by the number of days from oviposition to hatching. When the av. temps. were plotted on the x-axis of a graph against the length of the egg stage, an hyperbola was obtained. This curve is figured together with 2 obtained by other investigators for eggs of the same insect which had been kept at constant temps. Within the favorable range, eggs held at constant temps. developed less rapidly than did those exposed to the fluctuating temps. of the field. Above 21° C, the difference in duration time of the egg stages was small, but increased with lowered temp. Embryonic development proceeds very slowly at 10° C and only an occasional egg hatches. At 9° C, development is still slower, the misshapen embryos dying before hatching. At 10.7° and 10.9° C, development required 39 and 40 days, respectively. The sum of mid-hourly active temps. (temps. above 9° C) varied between 1740 and 1800 for all eggs that hatched.—*R. B. Swain.*

#### ANIMAL

11198. Altland, Paul D. (Nation. Inst. Health, Bethesda, Md.) Effects of discontinuous exposure to 25,000 ft.-simulated altitude on the body weight and reproductive system of immature rats. *Anal. Rec.* 96(4): 27. 1946.—An abstract.

11199. Crombie, A. C. (Cambridge U.) On intra-specific and interspecific competition in larvae of graminivorous insects. *Jour. Exptl. Biol.* 20(2): 135-151. 1944.—All expts. reported in this paper were carried out in a dark incubator at 30° C and 70% R. H. The ♀ of both *Rhizopertha* and *Sitotroga* ovoposit in places suitable for larval development, but the larvae themselves, usually in the 1st instar, choose the actual developmental site. The rate of oviposition of neither species bears much relation to the amt. of food present for the larvae, and the latter do not refrain from superinfestation of wheat grains. The competition which ensues is a struggle for space. Larvae attack each other directly after encounters within grains, and the supernumerary individuals are either killed or forced to migrate. The probability that any particular larva will survive is thus inversely proportional to the initial number present. Overcrowding tends to favor the survival of *Sitotroga*. Migration from the grains tends to decrease with later instars. Because of competition for space the number of larvae of the same age which survive in one grain is less than that which the food present in the latter could support. When the 2 spp. are competing, the average ratio of the survivors of *Rhizopertha* to *Sitotroga* as 1.3r:s, where *r* and *s*, respectively, are the initial numbers of larvae of each sp. This ratio remains constant at all densities when the larvae enter the grains at the same time in the same instar. When 1st instar larvae of the 2 species enter the grains at different times, the above relationship changes in favor of the

first comer. With greater differences between times of entry the severity of competition for space decreases, so that more larvae are able to survive. *Sitotroga*, alone, is able to take advantage of this decreased competition because of the occurrence of larvae with atypical rates of development in this species. Overcrowding in the immature stages had no effect upon the average developmental period of the larvae, or upon the sex-ratio, wt. or fecundity of the adults of either species.—*C. H. Beatty.*

11200. Lack, David. (Oxford U.) Competition for food by birds of prey. *Jour. Animal Ecol.* 15(2): 123-129. 1946.—Analysis is made of food studies by Uttendörfer in Germany of Falconiformes and Strigiformes. No 2 spp., in the same or in different genera, compete for food in the same habitat. However, when the vole, *Microtus arvalis*, becomes superabundant, as many as 5 non-congeneric species may take it for food in the same habitat without influencing one another. At times when the vole is scarce, each predator perhaps turns to different prey. Cause's thesis that 2 spp. with the same ecological requirements cannot persist together in the same region is tenable for the behavior of these polyphagous spp. in nature.—*S. C. Kendeigh.*

11201. Lindberg, Håkan. Ökologisk-geographische Untersuchungen zur Insektenfauna der Felsentümpel an den Küsten Finnlands. *Acta Zool. Fennica* 41. 1-178. 10 maps, 4 pl., 7 fig. 1944.—The following ecologic classification of rock pools is used: Type 1. Spray-water pools. These are near the water's edge and contain clear water with a salt content that varies from 0.98% to as low as 0.245%, depending on the amt. of ocean water which sprays into them. pH varies from 9 to 7.5. Diatoms are abundant even if the plankton is sparse. Often Enteromorpha and Cladophora are abundant on the walls of these pools. Type 2. Subsaline pools. Higher and larger than pools of type 1, beyond effect of waves, salt content 0.283 to 0.1%, pH 8.2-6.7, phyto- and zooplankton sparse including fresh-water, marine, and brackish-water spp. Type 3. Rain-water pools with barren sides. Salt content 0.072-0.008%, pH 8.8-6, bottom covered with detritus, submerged vegetation sparse, *Daphnia* spp. sometimes present, *Chironomus* larvae abundant at margins. Type 4. Rain-water pools with marginal vegetation. Water only occasionally reaches clumps of grass and miniature moors on the edges of the pool, water more or less brownish and acid, pH 6.7-4.2, salt content 0.035-0.007%, several spp. of mosses and flowering plants along margins, rich plankton including some sphagnophilic algae and animal associations. Type 5. Moss pools. Bed of pool partly or entirely covered with moss, most frequently *Hypnum fluviatilis*; marginal vegetation similar to rain-water pools, water brownish and acid (pH 5.8-3.8); salt content 0.064-0.07%; phyto- and zooplankton abundant, with a predominance of sphagnophilic forms. These pools often dry up during the summer, although the moss retains a certain amount of moisture. Type 6. Rock-sphagnum pools. Similar often to type 5 but with dominance of *Sphagnum*, free water surface seldom present, water brownish and acid (pH 5.7-4.9), salt content 0.017-0.007%, plankton flora and fauna rich in sphagnophilic forms, free swimming Cladocera lacking. These pools may dry up during the summer. Type 7. Small swamps. Bottom covered with layer of detritus, banks with *Hypnum fluviatilis* and *Sphagnum*. In the collections of free water the microflora and fauna are richer in spp. than in the other types. The occurrence of 35 spp. or groups of insect larvae is tabulated for one to several of each of these types of pools in the "Scharenarchipel von Ekenäs" near Tvärminne in western Nyland. Comparative data are included from the Åland Islands and the coast of the Gulf of Bothnia. Much information is given on the food, and feeding relations, of these pool inhabitants, and the geographic and ecologic distribution is presented for 56 spp. of insects.—*D. S. Farner.*

11202. Morley, Derek Wragge. The interspecific relations of ants. *Jour. Animal Ecol.* 15(2): 150-154. 1946.—Wheeler's classification of the mixobiotic colonies of ants is criticized on the grounds of its purely descriptive basis and its incompleteness. A more comprehensive systematic classification, in which behavior is used as the basis for the various groupings, is presented. There are 2 main categories of interspecific relations among the ants: those which are casual or facultative, and those which are obligatory. These 2 main categories are further divided into tolerant or co-operative



relationships, and competitive relationships. A description of each type of relationship is given, together with examples illustrating them. Myrmecophilous relationships can be dealt with under the same system, which is capable of easy expansion as new relationships are discovered.—*Auth. summ.*

11203. Nielsen, E. Steelmann. Über das Verhältnis zwischen Verwandtschaft und Verbreitung von Organismen in Beziehung zu ökologischen Studien auf Grundlage der Verbreitung. [The relationship between kinship and distribution of organisms in relation to ecological studies of the basis of distribution.] *K. Danske Videnskab. Selskab Biol. Meddelel.* 16(4): 1-24. Map. 1941.—Jordan's Rule is applicable to terrestrial organisms with sexual reproduction, and must be modified to apply to marine organisms. The author compares the distribution of *Stomias*, a genus of fishes, with that of the asexual dinoflagellate genus *Ceratium*, and concludes that with sexual organisms, where variation tends to be modified by chromosome crossings and hybrids are sterile, nearly related species exclude one another in similar environments unless they have different spawning seasons. In the case of fish and other motile organisms, a species can sometimes occupy an extensive range. The rule is especially clear where wandering is not a factor in distribution, for example, among Copepods. Parasites are a special case: the occurrence of closely related species in the same geographical area but in different hosts does not affect the generalization since they occur, in effect, in different environments. In the case of asexual organisms, such as *Ceratium*, the rule does not apply, since closely related forms occur in the same region and mutants are not bred out. The problems of distribution and relationship in asexual organisms must be studied by considering groups of species from similar regions and habitats with statistical methods.—*J. W. Hedgpeth.*

11204. Southern, H. N., and E. M. O. Laurie. (Oxford U.) The house mouse (*Mus musculus*) in corn ricks. *Jour. Animal Ecol.* 15(2): 134-149. 2 pl., 3 fig. 1946.—In Britain the house-mouse lives mainly in grain ricks and buildings. Populations in country areas alternate seasonally between a high density, while the grain ricks are occupied, and a low density, while living in the fields when all ricks have been threshed, though there are a few mice living in the fields at all seasons. Figures on population density from the Oxford neighborhood show that badly infested ricks may contain from 1.4 to 14 mice per cu. m. By Jan. > 90% of ricks are infested. The size of population rises rapidly in the autumn after the ricks have been built, reaching a peak in the spring; after a rick is 8 months old there is little, if any, increase in the mouse population. Counts of mouse-holes in the sides of ricks show that in wheat there is a fairly constant relation between the number of holes and the number of mice. Oat and barley ricks are presumably too loose for any such relation to be established. Break-back trapping in and around grainfields proved that the house-mouse is the 3d commonest small mammal living in the fields. During winter the field populations are small, but by spring, possibly increased by large numbers released from ricks at threshing, more of them are found in the grainfields. They have now started to breed at quite a high rate. By the summer this field population is more than sufficient to reinfest the new ricks as they are built. Though house-mice rarely come out of ricks once they have settled in, their range within the rick is considerable, and most of the population visits the external surface of the rick, as proved by poison-baiting expts. in the sides of the rick, which sometimes killed 90% of the population. The amt. of damage done by house-mice in grain ricks is given by the % of tailed grain in the total yield at threshing.—*Auth. summ.*

11205. Southern, H. N., J. S. Watson, and Dennis Chitty. (Oxford U.) Watching nocturnal animals by infra-red radiation. *Jour. Animal Ecol.* 15(2): 198-202. 2 pl. 1946.—Most nocturnal vertebrates cannot be watched during the greater part of their normal activities and successful photographs are often a matter of chance. By means of infra-red radiation and a special telescope it is now possible to make continuous observations on nocturnal spp. which generally have poor sensitivity to light of the longer wavelengths. This technique has been successfully used to study and photograph the brown rat (*Rattus norvegicus*).—*Auth. summ.*

11206. Spirito, Aldo. Vita anaerobica e rapporti ecologici.

[Anaerobic life and ecological relations.] *Boll. Zool. Agrar. e Bachiccol.* [Turin] 11(3/4): 49-62. 1940.—The ecology of some amphibian embryos is studied comparatively and referred to the capacity of anaerobic development found in *Discoglossus pictus*. The resistance of this species to anaerobiosis is due to a high anaerobic glycolysis. Many cases of adaptation to an environment poor in oxygen are examined and their differences with respect to the case of *D. pictus* emphasized.—*I. L. Coifmann.*

11207. Taylor, W. L. The wild cat (*Felis silvestris*) in Great Britain. *Jour. Animal Ecol.* 15(2): 130-133. Map. 1946.—In Britain the wildcat is restricted in range to the Highlands of Scotland. Information collected in 1946 indicates it to be resident in 24 and occasional in 21 of the 111 Forestry Commission areas.—*S. C. Kendeigh.*

11208. Van Someren, Vernon D. (Central Vet. Res. Inst., Kabete, Kenya Colony.) The habitats and tolerance ranges of *Lymnaea (Radix) caillaudi*, the intermediate snail host of liver fluke in east Africa. *Jour. Animal Ecol.* 15(2): 170-197. 4 pl., 4 fig. 1946.—*L. caillaudi* is the principal and most effective vector of fascioliasis in East Africa. This species of snail occurs very widely from Egypt to South Africa, and Sierra Leone to the east coast. The snail occurs mainly in those habitats found at the heads of valleys. The pH of the water has little effect on the distribution of the snail, but the opt. range is pH 6.5-9. The total hardness of the water also has little effect but the lower toleration limit is probably about 8 ppm.  $\text{CaCO}_3$ . In Kenya Colony, the water in a good habitat is usually clear, clean, permanent, shallow and with a slight current. Ferruginous waters are unfavorable. The  $\text{O}_2$  tension of the water is probably the chief limiting factor and should not fall below 75% saturation. The snails die of suffocation below 10% saturation, but show distress below 75-85% saturation. In closed containers the  $\text{O}_2$  consumption is not constant, but after an initial rise shows a sharp decrease to the distress saturation value of the dissolved  $\text{O}_2$  and thereafter a more gradual decrease till death supervenes. The relationship between decrease of saturation and decrease of  $\text{O}_2$  consumption is not proportional. Sunlight and lack of intensive organic pollution are essential in a good habitat. Normal temps. and altitude have little influence on the distribution of the snail. While the snail is more prevalent on black cotton soils, the nature of the bottom is more important, and this should be a firm mud, not flocculent. Rocky bottoms are seldom favorable. While the snail is not associated with any definite species of plants, a good habitat is characterized by a certain amt. of macrophytic vegetation and a sufficient abundance of diatomaceous and chlorococcal algae for food. Predators should be absent in a good habitat. *L. caillaudi* shows a marked association with *Biomphalaria pfeifferi*, a carrier of intestinal schistosomiasis, both in Southern Rhodesia and Kenya Colony. *Lymnaea caillaudi* is at times an amphibious snail, but is not found away from moisture even when out of water. The snail will sometimes not return to the water which it has left.—*Auth. summ.*

## PLANT

11209. Aario, L. Die grössenstatistische Analyse der Betulapollen in Torfproben. [Statistical analysis of size of Betula pollen in peat samples.] *Geol. Rundschau* 32: 612-626. 1942.—Determination of *Betula* spp. by the size of the pollen in peat samples does not yet seem possible.—*W. Gothan.*

11210. Auer, V. Der Torf und die Torfschichten als historische Urkunden Feuerlands und Patagoniens. [The peat and the peat deposits as historical documents of Tierra del Fuego and Patagonia.] *Geol. Rundschau* 32: 647-671. 1942.—Sequence and age of the peat mosses of Tierra del Fuego and Patagonia were detd. by 3 or 4 volcanic layers and the pollen diagrams. The diagrams show, on the whole, large regions with contemporaneous struggle of the forest and steppe. Before the first volcanic eruption there was a warm climate in the region of the eastern slopes of the Andes, which became cooler and wetter after the eruption. About the time of the 2d eruption a further warming took place and then a general cooling, which continued until after the 3d eruption, when a new warm period, evidently continental, ensued. Under these circumstances the forests could spread only in Tierra del Fuego and not into Patagonia because of the mountain barriers. The dry and warm period before

the first eruption corresponded with the warm period of the late glacial time in Europe, and the subsequent cooler and warmer climate may be correlated with the changes in the Northern Hemisphere.—*W. Gothan.*

11211. Bornebusch, C. H., og Kjeld Ladefoged. Hvidgranens og Sitkagranens Dødelighed i Hede- og Klitplantager i 1938 og 1939. [Mortality of *Picea canadensis* and *P. sitkaensis* in heath and down plantations.] *Forst. Forsøgsveesen Danmark* 15(4): 209-232. 15 fig. 1940.—In 1938 and 1939, great damage due to frost was observed on *Picea canadensis*, *P. sitkaensis*, Douglas fir, Contorta fir, *Larix leptolepis* and other tree spp. This was due to the exceptionally high temp. at the end of March, 1938, ranging from 0.5° to 10°C above the normal. Cambium commenced activity, and since in Apr. the temp. was as low as 3.8-9.7°C, it was destroyed. The damage sustained was least near the North Sea, and less in the dune regions than in the heaths. Sitka spruce was most severely injured while young; Canadian white spruce was most severely injured in older patches. White spruce was most severely injured when growing in clumps, but it suffered less damage when growing in shelter belts or in the open field. Sitka spruce suffered greatly, but not to such an extent that it is intended to discontinue its cultivation.—*P. A. Houberg.*

11212. Chapman, V. J. (*Univ. Coll., Auckland, New Zealand.*) Marine algal ecology. *Bot. Rev.* 12(10): 628-674. 1946.—Much work has accumulated on algal ecology and this paper is an attempt to integrate it. The world can be divided into a number of regions—N. Atlantic, N. Pacific, Caribbean, etc.—each with its characteristic algal flora. In several cases, e.g., N. Atlantic, S. Atlantic, a relatively simple basic zonation has been recognized. Ecologically, the algal flora of rock pools, salt pans, caves and salt marshes has not been studied as much as the flora of open beaches, so that there is a big field of research available. Our knowledge of the environmental factors is becoming extensive but we are still far from identifying the fundamental causes of the vertical zonations seen on sea shores. It is almost certain that these are associated with the tidal movements, but this involves a number of interwoven factors. There is an increase in the number of autecological papers, and this is promising because they will help us to understand some of the zonation problems. Advances have been made in algal plant geography and in studies of life-form, but in both these branches further advances will certainly be made. The usage of nomenclature is rapidly leading to chaos, and after a review of various usages by different investigators it is concluded that workers in marine algal ecology should employ the normal terminology of land ecologists.—*V. J. Chapman.*

11213. Daubenmire, R. F. (*U. Idaho, Moscow.*) The life zone problem in the northern intermountain region. *Northwest Sci.* 20(2): 28-38. 1 fig. 1946.—Life zones based on climate or physiography have proved unsatisfactory and difficult to identify. The most satisfactory system would be one based on the dominant species of the climax vegetation. In the northern intermountain region, between the divides of the Rocky Mts. and the Cascade Mts., south to 45° N. latitude, 10 vegetation zones may be recognized: Sedge-grass zone, above upper timberline; spruce-fir zone; arborvitae-hemlock zone; Douglas fir zone; Ponderosa pine zone; juniper-pinion zone; fescue-wheatgrass zone; wheatgrass-bluegrass zone; needlegrass-grama grass zone; and sagebrush-grass zone. Most plants are subordinates that depend on the presence of the few dominants which control the micro-environment. Animals, likewise, are usually subordinates, because they depend on the plants, directly or indirectly, for food and shelter.—*Hans Wilkens.*

11214. Diels, Ludwig. Das Verhältnis einiger Wuchsformen in der Flora von Deutsch-Südwestafrika. *Jahrb. Preuss. Akad. Wiss. Phys.-Math. Kl.* 1940: 91. 1940.—Ecological notes on *Combretum*, *Parinarium*, *Dichapetalum*, *Vigna*, *Ipomaea*, *Raphiacme*, *Helinus*, *Cissampelos*, *Acanthosicyos*, *Adenia*, *Cissus*, and *Sutera*.—*H. Simons.*

11215. Drew, W. B. (*Michigan State Coll., East Lansing.*) Floristic composition of grazed and ungrazed prairie vegetation in north-central Missouri. *Ecology* 28(1): 26-41. 2 fig. 1947.—A quantitative comparison is made between the vegetation of an unplowed, grazed and mowed tall-grass prairie of 160 acres and that of scattered unplowed, ungrazed and unmowed relics located in the same physio-

graphic region and on the same soil type. Frequency and density values were calculated from counts of stems of grasses, sedges, rushes, forbs, and woody species. Whereas dominant grasses furnished over 90% of all grasses counted on relic prairie, the same species furnished about 74% on domesticated prairie. Local site variations between the scattered relic prairies accounted for part of this difference, but the principal basis was the much higher frequency and density of 2 weedy native species (*Panicum lanuginosum* var. *fasciculatum*, *Setaria geniculata*) in domesticated prairie. A sedge and several forbs (especially *Antennaria neglecta*, *Viola sagittata*) likewise indicated a favorable response to grazing and mowing. Forbs such as *Aster ericoides*, *Eryngium yuccifolium*, and *Petalostemum purpureum* appear to have decreased under grazing and mowing. Whereas one group of forbs does not appear to be affected by domestication, another series of forbs are found in one type of prairie and not in the other. Some large forbs such as *Silphium laciniatum* are believed to have been eradicated from domesticated prairie as undesirable weeds. A comparison of the topsoils of the 2 types of prairie reveals no important differences. It is suggested that a distinction must be made between domesticated and relic prairie in studies on unplowed, native grassland.—*W. B. Drew.*

11216. Filzer, P. Die Pflanzensoziologie im Dienste der Geologie. [Phytosociology in the service of geology.] *Zentralbl. Mineral., Geol. u. Paläontol. Abt. B* 1942: 57-95. 3 fig. 1942.—The author emphasizes the importance of the knowledge of the plant association for geologists, because the quality of the soils can be judged by the composition of the associations. This knowledge is little cultivated by most geologists.—*W. Gothan.*

11217. Firbas, F. Zur spätglazialen Waldentwicklung Oberschwabens. [Late glacial forest development in Upper Swabia.] *Ber. deutsch. bot. Ges.* 59: 310-319. 1941.—Succession as revealed by a pollen diagram of the Swabian Federsee (after Bérbach) cannot be correlated with the zones of vegetation in northern Finland.—*W. Gothan.*

11218. Firbas, Fr. Pollenforschung und Waldgeschichte. [Pollen investigation and forest history.] *Umschau* 44(29): 452-455. 1940.—A popular article.

11219. Gerstner, Jacob. Some factors affecting the perpetuation of our indigenous silva. *Jour. S. African Forest. Assoc.* 13: 4-11. 1946.—Notes on trees that require cross-pollination by insects; those whose seeds are distrib. by animals (from ants to apes to man); woody plants that are in danger of extinction through stripping of their bark by native herbalists.—*W. N. Sparhawk.*

11220. Hein, L. Waldgeschichte der Mark. *Brandenburg. Jb.* 16: 31-34. 2 fig. 1941.—An abstract of earlier work of the author on the development of the forests in the Mark Brandenburg by pollen analysis.—*W. Gothan.*

11221. Mikyska, Rudolf. O vegetaci na haldách kamenečnyh břidlic u Hromnic na Plzeňsku. [The vegetation at the piles of vitriolic slates near Hromnice in the Pilsen region.] [French summ.] *Lesnická Práce* 25(9/10): 257-282. 10 fig. 1946.—Piles of vitriolic slates in the western part of Bohemia, remaining from an earlier manufacture of fuming H<sub>2</sub>SO<sub>4</sub>, represent a great deal of sterile material without useful vegetation. They have strongly acid reaction due to the presence of free H<sub>2</sub>SO<sub>4</sub>. The author describes the vegetation on these piles, which is principally composed of 2 types: *Calluna* (lichen) and *Betula pendula*. The acidity and the chem. composition of the remains of vitriolic schist have been described by Němec.—*A. Němec.*

11222. Gross, H. Drei bemerkenswerte steinzeitliche Moorfunde aus dem Kreise Ebenrode (Ostpreussen). [Three remarkable Stone Age moor deposits from Ebenrode (East Prussia).] *Altpreussen* 1940(3): 5p. 4 fig. 1940.—Determination of the age of several prehistoric tools by pollen analysis.—*W. Gothan.*

11223. Joachim, A. W. R., and S. Kandiah. (*Dept. Agric., Ceylon, India.*) Studies on Ceylon soils. XVI. The chemical and physical characteristics of the soils of adjacent contrasting vegetation formations. *Trop. Agric. [Ceylon]* 98(2): 15-30. 1942.—The theories to explain the existence of a distinct grassland (patana), fernland (kekilla) or parkland (damana) in close vicinity to jungle or forest in different climatic zones of Ceylon are reviewed and discussed. The pantana and kekilla follow the forest in ecological suc-

cession as the result of burning. Parkland soils are of the same nature as jungle soils. Damana is a quite permanent vegetation resulting from occasional burning.—C. A. Schroeder.

11224. Kolumbe, E., und M. Beyle. Neue Interglaziale aus Schleswig-Holstein und Hamburg. [The Interglacial from Schleswig-Holstein and Hamburg.] *Mitteil. geol. Staatsinst. Hamburg* 1940: 59-74. 6 fig. 1940.—Several sections of interglacial are described and the content of plants is detd., including the pollen. The fauna, especially the Coleoptera, are named. The authors give a correlation with the successive phases after Jessen and Milthers.—W. Gothan.

11225. Lawrence, D. B., E. G. Lawrence, and A. L. Seim. (U. Minnesota, Minneapolis.) Data essential to completeness of reports on seed germination of native plants. *Ecology* 28(1): 76-78. 1947.—A critical survey of the recent literature dealing with collection, storage, and germination of native seeds revealed that the details of the expts. were often inadequately described. The following list includes the kinds of information that are most essential to completeness of such reports: Kind of plant; exact geographic locality and date of seed collection; age, size, and condition of parent plant and fruit; method of extraction of seed from fruit; nature and condition of seed; place and date of testing; nature of pre-storage treatment; storage conditions and pre-germination treatment; germination conditions; length of germination period; germination habit; percentage germination (potential, apparent, and real) resulting from all tests; number of seeds tested and number of replications of the test; minimum time necessary from collection of seed to peak germination in laboratory, greenhouse, and out-of-doors; recommended procedures for obtaining best germination; name and location of institution where flowering, fruiting, and seedling specimens of the experimental material have been filed.—D. B. Lawrence.

11226. Musil, František. Carodějné kruhy. [Fairy rings.] [With Czech. summ.] *Lesnická Práce* 25(11/12): 341-355. 12 fig. 1946.—A study of the influence of mycelium of fungi on the content and the movement of water in the soil, on the soil reaction and on other properties of the soil. The decomposition activity of the mycelium releases N from the humus, which stimulates the growth of the plants in "fairy rings". The mycelium also contains a greater amt. of hormones causing a better growth and dark-green color of the plants. In consequence of the penetration of mycelium through the soil, the physical properties of the soil are impaired; in particular the capillarity in fairy rings is depressed to a minimum and the plants perish in consequence of the physiological drought. The mycelium lowers soil acidity.—A. Němec.

11227. Olmsted, Norwood, and James D. Curtis. (U. Maine, Orono.) Seeds of the forest floor. *Ecology* 28(1): 49-52. 1947.—One of the most common genera to invade cut over and burned areas of forest land is *Rubus*. To determine whether seeds of this and other genera are present before cutting, samples of litter and top mineral soil were collected from 7 forest stands in northern Maine. The seeds were identified, pre-treated, and subjected to germination tests. Seeds of 27 spp. numbering as high as 11,543,400 per acre were found, of which a maximum of 653,400 per acre germinated. *Rubus* was found in 5 of the stands and showed consistent though only average germination. Seeds were found in each stand for which there were no parent plants but no seeds were found for other plants which were present. These seeds and the plants which can grow from them are an important source of food to wildlife. It is quite possible that the *Rubus* seeds had been stored in the forest floor for some yrs.—J. D. Curtis.

11228. Robertson, Joseph H. (U. S. Dept. Agric., Ogden, Utah.) Responses of range grasses to different intensities of competition with sagebrush (*Artemisia tridentata* Nutt.). *Ecology* 28(1): 1-16. 4 fig. 1947.—22 forage spp. were grown under 3 intensities of competition with sagebrush (*Artemisia tridentata*) during 1942-1945 in the upper Sonoran zone of northern Nevada. Intensity of competition was varied by root trenching and complete eradication of the brush. Pruning the brush roots increased the plot yields of forage, but not as much as did complete eradication. Brush competition significantly reduced plant size,

earliness, seed yield, and succulence despite beneficial reactions on wind and evaporation. The different spp. are ranked according to earliness, summer succulence, yield, and competitive ability. Crested wheatgrass was average or above in all but summer succulence. Introduced spp. grew better in initial stands and, despite higher mortality, they yielded higher than did natives. *Agropyron trichophorum* ranked highest in cumulative yield. The maximum yield for all treatments occurred the 2d yr. although weather the 3d yr. was evidently equally favorable. Coincident maximum root extension and consumption of the extra residual soil moisture the 2d yr. are suggested as the cause of the decline the 3d yr.—J. H. Robertson.

11229. Roe, R., and G. H. Allen. Studies on the Mitchell grass association in South-Western Queensland. *Australia Counc. Sci. and Indust. Res. Bull.* 185. 1-27. 1944.—The expts. were conducted near Cunnamulla under a semi-arid climate with erratic rainfall. The results are for a 3-yr. period. With continuous grazing at the rate of one sheep to 5 acres there was no evidence of pasture deterioration. With one sheep per 2 1/2 acres, the proportion of Mitchell grass (*Astrelba pectinata*, *A. lappacea*, *A. clymoides* and *A. squarrosa*) was reduced, whereas with one sheep per 7 1/2 acres, the gross returns per acre were smaller. Rotational grazing (6-month periods) showed no benefit over continuous grazing and in some cases was detrimental.—E. Winters.

11230. Roll, Hartwig. (Hydrob. Anst., Plön, Holstei.) Weitere Waldquellen Holsteins und ihre Pflanzengesellschaften. Soziologischlimnologische Quellenstudien. II. *Arch. Hydrobiol.* 36(3): 424-465. 8 fig. 1940.—The plant societies of springs in a wooded environment in Holstein were studied. Temp. of the water and soil temp. at different distances of the springs were compared. In the springs near the Ratzeburger See, the most frequent association is the *Cariceto remotae*—*Fraxinetum*, in which *Equisetum maximum* is dominant. On the Küchensee the "helokrene" type of spring and the *Alnetum glutinosae* in various stages of development were studied. Near the Keller- and Dieksee the *Alnetum glutinosae* is developed in the headwaters or on their margin, the spring-area frequently being occupied by the *Cardaminetum amarae subatlanticum*.—I. Findenegg.

11231. Rosayro, R. A. de. (Forest. Dept., Ceylon, India.) The soils and ecology of the wet evergreen forests of Ceylon. I. II. *Trop. Agric. [Ceylon]* 98(2): 4-14; (3): 13-35. 1942.

11232. Sauramo, M. Die Geschichte der Wälder Finnlands. [History of the forests of Finland.] *Geol. Rundschau* 32: 579-594. Portrait, 12 fig. 1942.—In his investigations of the evolution of the forests of Finland, the author studied 400 pollen diagrams: 1) the time of the retreat of the ice (around 6,800 B.C.); 2) *Ancylus*-time (up to 5,000 B.C.); 3) *Litorina*-time (up to about 1,000 B.C.); and 4) the post-Litorina or Limnaea-time (up to the present). For the different zones for all tree spp. maps have been made showing the temporary distribution. The trees mapped are *Tilia*, *Ulmus*, *Corylus*, etc. *Pinus*, the dominant tree of today on dry heather soils, had already immigrated into Finland in period 1, and was mostly dominant in period 2. In period 3, dicotyledonous trees surpass *Pinus*. Towards the end of period 3, *Pinus* immigrated again. *Picea* became the dominant tree in Finland only at about 1000 B.C. Since the 13th century the limit of the *Picea* forests has been shifted in the east-west direction, but not in the northern-southern direction.—W. Gothan.

11233. Schwenkel, H. Das Naturschutzgebiet Schopflocher Moor. [The nature reserve of Schopflocher Moor.] *Nachrichtenbl. schweiz. Anst. 2*(53): 7-11. 8 fig. 1941.—The Schopflocher Moor is situated in southern Germany near the Randecker Maar well known to geologists. The author gives a review of the formation of the peat moss with pollen analyses by K. Bertsch demonstrating a succession beginning with the *Pinus* period and the subsequent hazel-, oak- and beach-time. The top of the peat moss is *Sphagnum* peat.—W. Gothan.

11234. Segerstad, F. Hård av. Om blockepifyter i Värmlands barrskogar. [The block epiphytes in Värmland coniferous forests.] [Eng. summ.] *Meddeland. Göteborgs Bot. Trädgård* 16: 113-123. 1 fig. 1944-1946.—The author has suggested the term "block epiphytes" for plants that appear on big blocks of moraine. Only blocks with nearly



vertical sides have been included, for which reason autochorous wandering is excluded. On 14 such blocks in the coniferous forests of Värmland, 29 spp. of that kind have been found. Biologically the spp. approach to the accidental epiphytes growing on trees in Scandinavia and Finland, among which 60% of them are found. The absence of the others is chiefly due to the fact that the moss cover on the blocks is ecologically different from the forks of the trees, etc. From the point of view of plant dispersal the block epiphytes belong to the following groups: 1) Anemochores, 14 spp.; 2) Zoochores, 14 spp., including 10 spp. of Endochores and 4 spp. of Myrmecochores; 3) Autochores, 1 sp.—*From auth. summ.*

11235. Senaratna, J. E. (*Dept. Agric., Ceylon, India.*) Patana burning with particular reference to pasturage and wet patanas. *Trop. Agric. [Ceylon]* 98(4): 3-16. 1942.—Regulated burning of patana or grasslands is shown to be beneficial and does not cause excessive erosion. The problem is one of succession. If the *Cymbopogon* climax is burned, the desirable *Themeda* climax is obtained.—*C. A. Schroeder.*

11236. Senn, Harold A. A bibliography of Canadian plant geography. VII. Additions; author, geographic and subject indices for the period 1635-1935. *Trans. Roy. Canadian Inst.* 26(1): 9-151. 1946.—A continuation of the work of J. Adams and M. H. Norwell. It contains additions for the period 1635-1935 and author, geographic and subject indices.—*J. J. deGryse.*

11237. Šmarda, J., and F. Šmarda. Geobotanické studie z provodí Svatky a Svitavy. [Geobotanical studies of Svatka and Svitava valleys.] [In Czech with Ger. summ.] *Sbor. Klubu Přírodovědeckého [Brno]* 23: 39-44. 1940.—The studies deal with cryptogam. investigations of Sykř Hills near Tišnov in Western Moravia. These hills belong to the Bohemian-Moravian plateau and are approx. of 1500-2100 ft. Some montane and submontane spp. appear in this low altitude, e.g., *Dryplodon patens*, *Saetania caesia*, *Brachythecium reflexum*, *Amblystegium subtile*, *Hypnum pallescens* var. *Scapania undulata*, *Sphenobolus minutus*, *Sphagnum* spp., *Gyrophora deusta*, *Lentinus adhaerens*, *Pholota flammans*, *Cudonia circinans*, *Omphalia campanella*.—*B. A. Květala.*

11238. Thomson, P. W. Die Ergebnisse der neueren deutschen quartärgeologischen Forschung im Baltikum. [Results of recent German investigations of Quaternary geology in the Baltic States.] *Geol. Rundschau* 31: 498-500. 1940.—A brief review, especially of the pollen analyses and forest succession. A list of the most important papers of the author and his pupils is added.—*W. Gothan.*

11239. Vernon, Robert O. (*Florida Geol. Surv., Tallahassee.*) Cypress domes. *Science* 105(2717): 97-99. 3 fig. 1947.—Observations made in Dead Lake and on the cypress domes of the Peninsula of Florida suggest that the domes originated in seasonal ponds or swamps, where the seed sprouted when not submerged, the seedling then growing high enough to stay above seasonal rises in water level. The dome is explained by a gradually deepening pond, the basin filling so slowly that adaptive changes in the plant could keep pace. The trees spread laterally, the seed floating into the wet area along the banks where germination is assured. Progressive growths of seedling, sapling, and tree from the periphery toward the center of the pond result in a dome-shaped profile. The gradual deepening of the water in the Peninsula of Florida appears to be caused by a regional rise of the ground-water level.—*H. M. Kaplan.*

11240. Whyte, R. O. Crop geography in relation to environment. *Scottish Geogr. Mag.* 62(2): 49-55. 1 fig. 1946.—Describes the relation of the major factors of environment to crop production and the agric. utilization of crops selected to give produce at certain stages, such as the vegetative (herbage grasses) or reproductive (cereals). Elaborates the theories of vernalization, photoperiodism and thermoperiodicity and, in giving examples, points out the relation of plant behavior to geographical location as affected by seasonal or diurnal variations of light and temp.—*C. E. Foister.*

#### OCEANOGRAPHY

(See also Entries 11201, 11212, 11260, 11263, 11817, 12956, 12957, 12961, 12962, 12963, 12964, 12965, 12966, 12967, 12968, 12969, 12970, 12972, 12973, 12975, 12995, 13008, 13009, 13016)

11241. Herlin, Nils. Algologische Studien im Meerbusen von Viborg. *Mem. Soc. Fauna et Flora Fennica* 20: 151-153. 1944(1945).—The occurrence of brown and red algae in Viborg Bay was studied at 3 localities. A salinity between 2 and 2.5‰ was the least that these algae could endure.—*W. Rosén.*

11242. Hesse, Richard. Osmoregulation als Energieverbrauch. *Jahrb. Preuss. Akad. Wiss. Phys.-Math. Kl.* 1940: 79-80. 1940.—In salt-poor or salt-free water, marine animals are endangered by the increasing amt. of fresh water in their internal body fluids which damages their protoplasm. In protozoa this fresh water, forced in the body, is pumped out continually by pulsating vesicles, functioning at the same time as "kidneys" and acting more and more with increasing difference of salt content [in molecular conc.]; similar conditions are seen, e.g., in cercariae and frogs. This pumping out of water forced osmotically into the body is termed osmoregulation. The glomeruli serving as water filters are invariably larger in fresh-water fish. *Cyprinus carpio*, compared with a flat fish of the same wt. (about 225 g.), has 24,000 vs. 4700 per kidney. In some marine animals, e.g., *Hippocampus*, glomeruli are entirely absent. Marine animals mostly do not need osmoregulation, their body fluid having the same conc. as sea water. Only animals capable of osmoregulation can enter fresh water. Osmoregulation by renal activity is not performed automatically; it works against the osmotic potential. Hence energy is necessary which is obtained by oxidation of foodstuffs. In Teleostii the molecular conc. of the body fluid is somewhat lower than that of sea water; no water is forced into them or withdrawn from them. Further examples of the influence of osmoregulation in *Aurelia aurita*, *Asellus*, *Gammarus pulex*, air-respiring pulmonate snails, culicid larvae and fish, such as *Gasterosteus aculeatus*, trout, *Alosa* spp., *Salmo*, *Cottus quadricornis*, etc., are discussed.—*H. Simons.*

11243. Lucas, C. E., and K. M. Rae. The plankton of the North Sea in relation to its environment. I. The hydrological background in the southern North Sea, 1930-37. *Hull Bull. Marine Ecol.* 3(17): 1-33. 1946.—As a background to a discussion of the significance of the continuous plankton records of 1933-37, to appear in Part II, the regular surface salinities over a series of routes in the central and southern North Sea have been analyzed for 1930-37. These salinities have been observed on steamship routes and at lightships, and are published annually by the International Council for the Study of the Sea. The records indicate a cycle of salinity, having fair uniformity over the whole North Sea area, with a maximum during the winter 1934-35. Parallels are drawn with the periods 1920-22 and 1903-8, and possible connection with variations in strength of the Gulf Stream system are discussed. It appears that while the increases in the central North Sea must have been derived mainly from the north, the major increases in the Southern Bight and the eastern Channel must have arrived from the west. The direction of surface currents at Varne Lightship in the Strait of Dover is not in harmony with this conception, since westerly flow often takes place there when salinity observations elsewhere suggest that the water mass is moving east. The deeper currents, however, are known to be more easterly, and it is believed that only the most extreme westerly Varne currents indicate hold-up or reversal.—*E. S. Deevey.*

11244. Smith, F. G. Walton. (*U. Miami, Florida.*) Effect of water currents upon the attachment and growth of barnacles. *Biol. Bull.* 90(1): 51-70. 6 fig. 1946.—The work of previous authors, dealing with the effect of water currents upon barnacle attachment, growth and distribution, is briefly reviewed. Expts. were conducted to determine the effects of water currents upon the attachment and growth of barnacles, and particularly of *Balanus amphitrite*. Submerged rotating discs and glass tubes of graded cross-sectional diam. were employed to provide variations in current velocity. The velocity of water current limiting attachment appears to lie between 0.5 and 0.9 knot for *Balanus amphitrite*, between 0.4 and 0.7 knot for *B. eburneus*, and above 1.1 knots for *B. improvisus*. Following attachment the growth rate of barnacles was found to be increased by water currents of velocity <1.5 knots and to be decreased by currents with velocities in excess of this. The adverse effects of water currents were found to decrease with increasing age

of the barnacles subsequent to attachment. 6 hrs. after attachment, growth rate was reduced to  $\frac{1}{3}$  of normal by a 1.5 knot current and completely stopped by a 3 knot current. 5 days after attachment, growth was prevented by currents ranging between 3.3 and 8 knots. Loss of attachment appeared to some extent among all barnacles in which growth rate was reduced. This loss was greatest at velocities bringing about complete cessation of growth. It is suggested that loss of attachment is due to interference with the feeding process, followed by reduction of growth rate, death, and diminished adherence. Possibly due to an orientation to the current which facilitates feeding, barnacles attached for 1 day or less show less retardation of growth rate and loss of adherence than barnacles 2 days old. Since tidal currents are almost invariably intermittent it appears from the data presented that they are not sufficient to prevent the colonization of suitable surfaces by barnacles, except where the velocities are unusually high. It also follows from the numerical results obtained that on vessels making short stays in port and relatively long voyages, little permanent barnacle fouling will occur, since those organisms which attach will be killed and at least a portion of them dislodged. The evidence does not preclude, however, the continued growth of barnacles upon slow vessels making longer stays in port, and their geographical distribution by this means.—*Auth. summ.*

11245. Trahms, Otto-Karl. (*Biol. Forsch.-Anst., Hindensee, Germany.*) Beiträge zur Oekologie küstennaher Brackwässer. II. Die Bodenfauna und Bodenflora des Grossen Jasmunder Boddens. *Arch. Hydrobiol.* 36(1): 1-36. 6 fig. 1940.—The Grosser Jasmunder Bodden is a body of brackish water 57 km<sup>2</sup>, and of an average depth of 5 m., indirectly connected with the Baltic. The NaCl conc. amounts to 6.5%. The deeper parts of the bottom are covered with a blackish mud containing H<sub>2</sub>S, in which no animals were found. The shallower sandy areas also are but scarcely inhabited by animals, development of aquatic plants being hindered by the waves. The chief biotope of the Bodden is the phytal, composed of 9 spp. of algae among which *Chara* plays an important role and 5 spp. of Phanerogams, mostly Potamogetonaceae. That is considerably less than the number of spp. found on the shore of the Baltic. From Hindensee to the Jasmunder Bodden the number of spp. of algae decreases greatly, a fact that cannot be explained by lower salinity. It is rather the high production of phytoplankton in the Bodden that hinders the photosynthetic process in the deeper parts by reducing the transparency of the water, and the wind that keeps the sand moving in extended regions of the ground. The bottom fauna comprises marine, brackish and limnetic spp. Compared with other habitats of equal salinity, the number of spp. is small. Marine forms are reduced in size.—*I. Findenegg.*

#### LIMNOLOGY

(See also B. A. 21(4): Entries 10146, 10157, 10372, 10513, 10558, 10572, 10664; and in this issue 11212, 11230, 11261, 12315, 12915, 13017, 13035)

11246. Häyrén, Ernst. Spridda anteckningar om alger och vattenvegetation i Finland. [Miscellaneous notes on algae and aquatic vegetation in Finland.] *Mem. Soc. Fauna et Flora Fennica* 20: 4-10. 1943(1945).—Contains a list of spp. and localities.—*W. Rosén.*

11247. Jaernefelt, H. Ein kleiner Beitrag zur Tritonfrage. *Arch. Hydrobiol.* 36(2): 319-329. 1940.—Little attention has been paid up to now to the dead suspended matter in the water of lakes. As such tripton may be important as food for Cladocera and Rotatoria, the study of its quality, quantity and chem. composition is of great interest. Knowledge of its origin and decomposition is essential in estimating the productivity of lakes. Fractional sedimentation is a possible method of separating the heterogeneous components of the tripton. Generally it is composed of mineral grains, flocks of humus, detritus, fragments of wood. In Finnish lakes much of the tripton consists of silt particles, wood fibers, and peat. A relatively high amt. of starch grains is found in most lakes, also in those situated in thinly populated wooded areas. The maximum amt. of suspended matter generally occurs above the hypolimnion.—*I. Findenegg.*

11248. Kann, Edith. Oekologische Untersuchungen an Litoralalgen ostholsteinischer Seen. *Arch. Hydrobiol.* 37(2): 177-269. 20 fig. 1940.—Six lakes in Holstein were studied

as to their littoral algae. Among them the Grosser Plöner See, Kellersee and Dieksee are rich in lime, while the Kleiner Ukleisee, Garrensee and Pinnsee are poor in salts. All 6 lakes are eutrophic. The chief factors on which the growth of littoral algae depend are: the strength of waves, the influence of polluted waters, strong or feeble light and the kind of the substratum. Every season favors certain spp. of algae; e.g., in the Grosser Plöner See, in early spring, submerged stones and piles are covered with *Ulothrix zonata* and diatoms; later on, higher temp. and more intensive light favor *Cladophora glomerata* (in the sublittoral *C. aegagrophila*), *Stigeoclonium tenue* and *Draparnaldia plumosa*; in summer, to these are added *Pleurocladia lacustris* and *Rivularia biasollettiana*; in autumn, *Cladophora* vanishes, being totally overgrown by diatoms and *Ulothrix* develop anew; in winter, all algae are removed from the substratum by waves and ice. Rocks above the water still sprinkled by the waves are covered by calcified crusts formed by *Dichothrix orsiniana* and *Phormidium favosum*. The dysphotic region begins in 3-5 m. Chlorophyceae and Phaeophyta are not to be found in deeper zones. In all the 3 lakes rich in lime, the same spp. of Chlorophyceae and Conjugatae occur; on the contrary, Cyanophyceae and Rhodophyta are represented by different spp.; an explanation of this fact cannot be given. The 2d group of lakes poor in lime comprises small basins of wooded regions. Stones are rare, the bottom deposits consisting chiefly of dead leaves and stems. Characteristic of this group are some spp. of Desmidiaceae and Zygnemataceae. Some Cyanophyceae (*Hapalosiphon*, *Tolypothrix*) seem to be very sensitive to different amt. of carbonate. *Phormidium subtile* also occurs only in the most acid Pinnsee. Diatoms are scarce, Phaeophyta and Rhodophyta are virtually absent. As there is little substratum fit to be overgrown, in these lakes the littoral algae are less frequent, both qualitatively and quantitatively, than in lakes of the first group. Compared with the oligotrophic lakes in the Alps, the submerged beaches of the eutrophic lakes in Holstein are large, thus favoring the development of littoral microphyta. But according to the slight transparency of the water it is limited to a zone of 10 m. under the surface. In oligotrophic lakes the submerged beaches are much less developed, but the dysphotic region begins at 20-30 m. only.—*I. Findenegg.*

11249. Kann, Edith. Cyanophyteenkrusten aus einem Teich bei Abisco (Schwedisch-Lappland). *Arch. Hydrobiol.* 37(4): 495-503. 9 fig. 1941.—Calcified crusts on stones in the littoral, caused by Cyanophyceae, were not known in ponds. The crusts in a pond near Abisco in Sweden were formed by *Schizothrix lalerithia* and *Dichothrix gypsophila*. In the littoral of lakes, *Schizothrix* and *Rivularia* or *Phormidium* generally cause crusts. This difference may be attributed to the feeble wave action in the pond.—*I. Findenegg.*

11250. Mitis, Heinz von. (*Hochsch. Bodenkult., Wien, Austria.*) Oekologische Studien am Lusthauswasser, einem Altwasser im Prater von Wien. *Arch. Hydrobiol.* 37(3): 426-465. 10 fig. 1940.—The "Lusthauswasser" is a standing water of about 3 m. depth in a dead river branch of the Danube and shows typical characteristics of an "Old Water". The main ecological factors are the temp. of the water, secondarily the amt. of dissolved salts and gases. The water is extremely eutrophic although the amt. of nitric salts is rather small. Phosphates exist in large quantities. In the depth of the ponds a H<sub>2</sub>S-layer is developed which on its surface is covered with a plate of bacteria, formed chiefly by *Chromatium okenii*. 3 biotops: littoral, pelagic and facial are distinguished. The littoral comprises the bottom (inhabited by *Sialis* larvae, Oligochaeta and larvae of Chironomidae) and the submerged plants, among which numerous stenotopic spp. are present. The pelagic is divided into the chief layer with typical plankton forms of Flagellatae, Diatomeae and Rotatoria, the above mentioned bacteria-plate and the H<sub>2</sub>S-zone with *Corethra plumicornis*. The facial is the biotope of the water surface and is populated by the pleuston, formed by Gerridae and Poduridae. The biol. factors of the water, the various biotopes and the biocenoses form an inseparable totality that represents the limnological type of the "Old Water".—*I. Findenegg.*

11251. Novak, Willi. Über die Verunreinigung eines kleinen Flusses in Mähren durch Abwässer von Weissgerbereien, Leder- und Leimfabriken und andere Betriebe. *Arch. Hydrobiol.* 36(3): 386-423. 12 fig. 1940.—The little

Balka river in Moravia carries, in some reaches, plenty of organic matter from tanneries, leather- and gluefactories. In 3 periods of the year 1937 the water was chemically analyzed and investigations of the bottom fauna and flora were made. In the most polluted zones *Bacterium coli*, *B. megathesium*, *Spirillum sanguineum*, *Zoogloea ramigera*, *Oscillatoria tenuis*, *O. limosa*, *Paramecium caudatum*, *P. bursaria*, *Tubifex tubifex*, *Chironomus* typ. *thummi* and other saprobiotics were abundant, fishes and rooted aquatic plants were missing. In the reaches where the water was less putrid owing to self-purification or clear tributaries, *Asellus aquaticus*, larvae of Trichoptera and Ephemeroidea in small number were found and *Fontinalis antipyretica* occurred. The fish fauna was composed of some spp. of Cyprinidae, *Esox lucius* and *Perca fluviatilis*.—*I. Findenegg*.

11252. Oberzill, Wilhelm. (Reichs-Anst. Fischerei, Wien, Austria.) Biologisch-chemische Untersuchung des Tritonwassers im Gebiete der alten Donau bei Wien. *Arch. Hydrobiol.* 37(4): 533-577. 11 fig. 1941.—The Tritonwasser consists of a series of connected ponds in a dead river branch of the Danube, whose depth is about 5 m. In intervals of 2 weeks chemical and biol. investigations were made over the period of one year. In contrast to deeper lakes, the water circulates several times each yr. These frequent circulations and the changing level of the water are of great influence on the chem. qualities of the pond water. In the periods of stagnation the dissolved  $O_2$  vanishes, the amt. of ammonia and phosphate increases. Nitrate was found in larger quantities in late autumn and in winter. In summer these salts are taken up by the autotrophic plants, in winter and in early spring reduction is effected by bacteria. The quantity of bacteria is low in summer and increases in autumn in connection with the decomposition of plankton matter. The highest production of plankton coincides with the maximum of temp. of the water. *Microcystis aeruginosa* is the chief form of the summer plankton. In colder seasons, Chrysomonadineae, Euglenineae, Dinoflagellatae and Bacillariophyta form the planctic associations. Some spp. generally favored by low temp. may be found in larger quantities in summer also. A considerable difference is noticed, if recent plankton samples are compared with those collected yrs. ago. In the summers of 1926-1928, *Asterionella gracilima* was the most frequent sp.; 10 yrs. later it did not occur at all and *Microcystis aeruginosa* had taken its place. This change is attributed to the increased amt. of organic matter, the environments of the water recently being more populated. Quantitatively the production of plankton in the cool season is only  $1/10$  of that observed in summer. In periods of intensive production, the phytoplankton forms about  $9/10$  of the total plankton vol. The maximum of the zoopl. does not coincide with that of the algae, but precedes or follows it. Probably *Microcystis* is not suited as food for the zooplankton.—*I. Findenegg*.

11253. Ohle, Waldemar. Chemische Gewässererkundung in Schwedisch-Lappland. *Arch. Hydrobiol.* 36(3): 337-358. 16 fig. 1940.—Chemical analyses of water were made in connection with the hydrobiological investigations of Thienemann in the environment of Abisko in Sweden. All waters were generally poor in salts, except where limestone is present. In June when the snow is melting the amt. of salts decreases but the content of humus particles increases, the decomposed matter of the terrestrial vegetation being washed down into the streams.—*I. Findenegg*.

11254. Pavišić, V. Beiträge zur Fauna Kroatiens. Die Dendrotelmenfauna von Požega und seiner Umgebung. *Arch. Hydrobiol.* 37(3): 471-476. 1940.—In Croatia, 28 spp. of Rotatoria, Oligochaeta, Crustacea and Insecta (esp. larvae of Diptera) were found in hollows of trees, filled with rain water. 14 of the spp. had not been known to occur in that habitat.—*I. Findenegg*.

11255. Schellenberg, A. (Zool. Mus., Berlin, Germany.) Die subterranean Amphipoden des unteren Maintales. *Arch. Hydrobiol.* 36(3): 466-482. 4 fig. 1940.—The material of subterranean Amphipoda collected by Noll in 57 wells and springs of the Main Valley from Karlstadt up to Hanau contained 6 spp. Most forms known from similar habitats in the upper Rhenish plain were missing except *Niphargus aquilex aquilex* and *Crangon subterraneus*. *N. p. puleanus* and *N. a. aquilex* never were found together in the same locality; the former occurs in mountain reaches, the latter in

plains. The proper habitat of *Niphargellus nollii* is the little spaces between the stones and pebbles of diluvial deposits. *Niphargus fontanus* lives in the water-filled calm crevices and is chiefly found in water of caverns. *N. inopinatus* is considered a distinct sp., not a var. of *N. nollii*. The organs of chemical sense on the antennae ("aesthetetasken") are better developed on small subterranean spp. than on larger ones. From that it may be concluded, that the small forms living in small spaces of the ground find their food rather by the chemical sense, while the bigger ones, moving in larger cavities, rely on touch.—*I. Findenegg*.

11256. Schwickerath, M. Die Sphagneta der fenno-skandinavische Forscher, vom Gesichtspunkt der erweiterten Charakterartenlehre aus betrachtet. *Arch. Hydrobiol.* 37(4): 598-613. 1941.—In studying the results of several investigators about the Sphagneta of Fenno-Scandinavia and comparing them with his own investigations in Germany, the author concludes that it may be possible to combine the 2 methods used in phytosociology (but without mixing them), i.e., the method of determining the associations by its constants and that giving preference to the characteristic spp. In transforming the results of one method into the form of the other one, not only frequency and constancy of the characteristic spp. must be considered, but also their relatively optimal vitality. When determining exactly the essential features of "differential spp." a certain connection is revealed with the geography of plants. The ordo Ericeto-sphagnalia is divided into the Ericion tetralicis (that is not being further discussed) and the Sphagnion europaeum. The latter comprises the Sphagnion atlanticum, to which belong the Sphagnetum imbricatum and the Sph. papillosum and the Sphagnion continentale with the subdivisions of the Sphagnetum medii et rubelli and the Sph. fusci. In Sweden, the Sph. medii et rubelli is more frequent, in Finland the Sph. fusci prevails, where it finds its optimal living conditions. In some respects it shows a tendency to change into the Empetro-Vaccinion.—*I. Findenegg*.

11257. Viets, Karl. Ausbreitungswege und nacheiszeitliche Verbreitung der Kaltwasser und Strömungen leidenden Wassermilben in Europa. *Arch. Hydrobiol.* 37(2): 278-319. 6 fig. 1940.—In carrying on the ecological and geographical studies of Walter and Thienemann on Hydrachnellae inquiries were made concerning the recent distr. of 219 rheophile and oligotherm spp. of this group between 0°-30° east longitude and from the Alps to Northern Europe. Conclusions are drawn about the preglacial distr. and migrations since the glacial period. As all the spp. began to diffuse from the ice-free parts in Central Europe (the German uplands), 3 groups may be distinguished according to the regions they have reached up to now. Group I reached the British Isles or Scandinavia. Among it 3 subdivisions are made: IA occurs recently from the Alps up to northern Europe (*Aururus scaber*, *Lebertia stigmatifera*, the extremely cold-stenotherm *Rivobates norvegicus* and 40 other spp.). They may be considered as preglacial palaearctic elements with a strong tendency to spread. IB does not occur in the Alps (*Thienemannia schermeri* and 11 spp.) and IC lives in the northern lowlands and Scandinavia only (10 spp.). Both groups comprise northern spp., that lived in the glacial time near the ice-margin and retired with it in the postglacial. Group II reached the lowlands only and thus did not succeed in crossing the regions of the North Sea and of the Baltic. The spp. of this group are estimated to be old central European forms, with a stronger tendency to diffuse, which explains the wide distr. in easterly and westerly direction. Among them IIA (*Aururus crinitus* and 8 other spp.) recently occur from the Alps to the n. lowlands, IIB (10 spp.) lives in the uplands of central Europe and in the n. lowlands and IIC (8 spp.) in the lowlands only. The forms of group II probably settled in the preglacial in the German uplands, partially also in northern Europe or in the Alps. They were not able to spread. Group III is restricted to central Europe. IIIA (*Atractides stadleri*, *Lebertia scheuchlii* and 54 spp.) remains in the regions that they have inhabited since the preglacial. IIIB (*Feltria rubra*, *Lebertia tuberosa* and 23 spp.) may once have been widely spread from East to West and in the Alps. Recently they live in the German uplands and in the Alps. IIIC (*Lebertia zschokkei* and 45 spp.) is restricted to the Alps where they already lived before the glacial period.—*I. Findenegg*.



11258. ZoBell, Claude E., and Janice Stadler. (U. Wisconsin, Madison.) The oxidation of lignin by lake bacteria. *Arch. Hydrobiol.* 37(1): 163-171. 4 fig. 1940.—Samples of purified lignin differing in source and prepn. were added to natural and to synthetic lake water, inoculated with lignoclastic bacteria. After a 4 weeks' incubation at 28°C, 100 times as many bacteria were demonstrated by plate counts as in controls to which no lignin was added. Purified lignins were not found to be bacteriostatic although by adsorption they temporarily reduce the plate counts. Expts. on the O<sub>2</sub> uptake of bacteria showed that from 4.4 to 14.7% of the lignin are oxidized in 30 days at 28°C. Evidence is presented also by chemical analyses that lignin is slowly decomposed by certain lake bacteria. It is believed that bacterial oxidation of lignin consumes appreciable quantities of O<sub>2</sub> in lakes.—I. Findenegg.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 11183, 11184, 11242, 11251, 12104, 12105, 12158, 12976, 12979, 13144, 13146, 13149)

11259. Bergersen, B., and Johan T. Ruud. Pelagic whaling in the Antarctic. IX. The season 1938-1939. *Norske Vidensk. Akad. Oslo Hvalrådets Skrift. Sci. Results Marine Biol. Res.* 25. 1-46. 2 pl. 1941.—Tabular and graphical summaries are presented for the season 1938-1939, based on logbooks from all Norwegian and most foreign expeditions. Summaries give monthly and total catch by species and by geographical position, in terms of numbers of whales, barrels of oil produced, and mean values per catcher's day's work; measurements are given for fin and blue whales. Changes since 1937-1938 are evident in: areas receiving most intensive whaling; total numbers of blue and fin whales captured; percentage of immature fin whales captured; size distribution of whales. All evidence points to the conclusion that the stock of whales in the Antarctic is undergoing serious overfishing.—E. S. Deevey.

11260. Brown, W. A., and C. Cheng. Investigations into the food of the cod (*Gadus callarias* L.) off Bear Island, and of the cod and haddock (*G. aeglefinus* L.) off Iceland and the Murman Coast. *Hull. Bull. Marine Ecol.* 3(18): 35-71. 1946.—Stomachs of 1277 medium-sized cod, collected in 1936-1938, were examined, 824 from Bear Island, and the rest from Spitzbergen Bank, Murman Coast, Andanes, and Iceland. Haddock stomachs (177) were obtained from the Murman Coast and Iceland. Bear Island and Spitzbergen bank stomachs showed the importance of Polychaeta, Amphipoda, Euphausiacea, Caridea, Ophiuroidea, and fish (herring, capelin, and codling) in the diet, and the seasonal variation in diet. Pelagic crustacea, especially *Thysanessa inermis* (Euphausiacea), were most important from Feb. to Aug., and young herring from Nov. to Dec. In the other areas, where collections were more limited, fish play a dominant role in the food of cod. The haddock on the Murman Coast feeds (in mid-winter) predominantly on ophiuroids and polychaetes. A comparison made between the stomach contents of cod and haddock taken together in the same trawl shows that the haddock feeds more heavily on Polychaeta, Lamellibranchia, Gastropoda, Gephyrea, Echinoidea, and Ophiuroidea, while the cod feeds more heavily on fish (herring, capelin, codling, and sand-eel). There is little preference between the two in regard to Crustacea in the seasons and places sampled. A complete list of organisms identified is appended.—E. S. Deevey.

11261. Hess, A. D., and G. G. Keener, Jr. (Tennessee Valley Authority, Wilson Dam, Ala.) Effect of airplane distributed DDT thermal aerosols on fish and fish food organisms. *Jour. Wildlife Management* 11(1): 1-10. 1 pl. 1947.—Investigations were carried out in the Wheeler and Kentucky Reservoir areas of the Tennessee Valley during the summer of 1945 to determine the effect upon fish and fish food organisms of a formulation of 20% DDT in Velsicol NR-70 applied by airplane in the form of a thermal aerosol at the rate of 0.1 lb. DDT per acre with an average maximum recovery in the center of the swath of about 0.012 lb. per acre. The maximum effect at the center of the swath resulted in almost complete elimination of anopheline and culicine mosquitoes and surface Hemiptera and in a significant reduction in Coleoptera and amphipod crustacea with little or no reduction of other macroscopic forms. The effect of routine treatments on an area basis was almost a complete

elimination of anopheline mosquitoes and surface Hemiptera and a significant reduction in culicine mosquitoes with no evidence of reduction in other forms. Observations in areas at the end of a full season of 16 applications at the rate of 0.1 lb. DDT per acre indicated that surface Hemiptera had been almost completely eliminated and mosquitoes were considerably reduced but other forms were not significantly affected. Surface Hemiptera are not important as fish food and because of their predeaceous habits may actually compete with fish for food. On the basis of these studies, it is therefore concluded that DDT applied in the manner indicated does not have any significant injurious effect upon the total population of fish food organisms. Detn. of fish populations at the end of the season in areas which had received 16 routine weekly applications of DDT thermal aerosols at the rate of 0.1 lb. DDT per acre showed an average population per acre of 12,549 fish weighing 700 lbs. From a consideration of the total number and weight, the species composition, the abundance of young-of-the-year, and the condition of the fish in comparison with those in untreated portions of the reservoirs, it is concluded that the DDT treatment had no injurious effect upon the resident fish population. The above conclusions apply only to this dosage and method of applying DDT and do not mean that increased rates of application or different methods of application might not have injurious effect upon fish and fish food organisms.—Authors.

11262. Jahoda, Wm. J. (U. New Hampshire, Durham.) Survival of brook trout in water of low oxygen content. *Jour. Wildlife Management* 11(1): 96-97. 1947.—The ability of native brook trout (*Salvelinus fontinalis*) to survive low concs. of dissolved O<sub>2</sub> if low water temps. exist is shown by observations made on a New Hampshire stream where O<sub>2</sub> concs. went as low as 1.1 ppm. without killing the fingerling trout present.—W. J. Jahoda.

11263. Korringa, Pieter. Experiments and observations on swarming, pelagic life and setting in the European flat oyster, *Ostrea edulis* L. 249p. Illus. Dissertation: U. Amsterdam, 1940.—Crisis of oyster industry in Zealand waters in the years following 1930 was due to rapid propagation of *Crepidula* introduced from the U.S.A., and to ravages of so-called "shell disease". This compelled the Dutch Government to undertake extensive hydrological and biological studies in the basin of the Oosterschelde with the view of assisting the oyster growers by predicting the time and intensity of the attachment of oyster larvae (setting) of *O. edulis*. Hydrological conditions of the Oosterschelde are characterized by an almost perfectly oscillating movement of tidal water, with the maximum current velocities of 100-150 cm./sec. at high water (50 cm./sec. in shallow places). At each tide about 3.8% of the volume of basin water replaced. Salinity is rather high, 27.7%, and constant. Summer water temp. rises above 18°C but only sporadically reaches 22°C. High water temp. does not directly influence spawning and swarming of *O. edulis* but provides more favorable conditions for the survival and attachment of larvae. Spread of spawning of oyster population of *O. edulis* over a longer period than that of non-incubatory species is due to frequent sex changes. No correlation was found between the spawning and full moon periods, as was postulated by Orton. Counting and measuring all the larvae taken daily in quantitative plankton samples (100 liters each) show that contrary to the opinion of Prytherch regarding *O. virginica*, the larvae of *O. edulis* do not drop to the bottom at any stage of tide but are all the time at the mercy of the tidal streams. Only about 250 out of every 1,000,000 liberated larvae attach, and 90% of the newly-set individuals die before winter. Field expts. with white and colored plates placed in water at various angles show that under natural conditions the color of the substratum has little influence on the intensity of setting; contrary to the conclusion of Cole and Jones for *O. edulis* and Hopkins for *O. lurida*, that the heaviest setting of larvae takes place on the under-horizontal surfaces, the author concludes that more spat settles on upper surfaces. Vertical surfaces are the least suitable for attachment. From an analysis of setting records inference is made that environmental conditions such as temp. and salinity have but little direct influence on setting. Critical examination of evidence presented by Prytherch that Cu content of sea water induces the attachment and metamorphosis of the oyster larvae forces the author to reject Prytherch's hypothesis as untenable.

and to conclude that Prytherch's own data cannot be used in support of his assumption. Cu content of water has no influence on the intensity of setting. The intensity of setting at a given station is detd. by the number of full grown larvae passing over it in the course of the tide. Prediction of setting at short notice is possible. It requires daily recording of the water-temp. and frequent detns. of the number and size of the oyster larvae for volume of water. The best setting may be expected in places where the number of full-grown larvae is large at the time when the current velocities are small. Besides original observations, author gives an extensive and critical review of widely scattered literature on oyster biology.—P. S. Galtsoff.

11264. Ricker, William E. (Indiana U., Bloomington.) Hell's gate and the sockeye. *Jour. Wildlife Management* 11(1): 10-20. 1 fig. 1947.—Recoveries of sockeye salmon tagged immediately below Hell's Gate on the Fraser River cannot be used to decide what effect that barrier had on the run as a whole, because the sockeye tagged were probably heavily weighted with the weaker blocked fish. A correlation between the duration of "favorable" water levels at the Gate and an index of the success of migration and production on the river as a whole, over 20 yrs., may be the result of phenomena associated with water levels rather than the levels themselves. Such a possible correlated factor would be the water conditions on spawning grounds. Because ♂ salmon surmount barriers much more easily than ♀, and no general excess of ♂♂ has been observed on spawning grounds above Hell's Gate in any recent yr. of observation, it is concluded that the number of sockeye blocked by the Gate has probably been negligible during that time.—W. E. Ricker.

11265. Went, Arthur E. J. (Dept. Agric., Dublin, Ireland.) Salmon of the river Shannon in 1944 and 1945. *Jour. Animal Ecol.* 15(2): 155-169. 5 fig. 1946.—The bulk of the fish captured in the River Shannon in 1944 and 1945 belong to the 2-year smolt class, but the 1-yr. smolts form 8.2 and 12.8%. In 1944 the proportion of 3-yr. smolts was abnormally high. Grilse (fish which have spent just over a full year feeding in the sea) form 2/3 or more of the total catch. The next most important age group was the small spring fish (2 complete yrs. feeding in the sea). Since the inception of the hydro-electric scheme there has been a considerable reduction in the numbers of fish which have spent 2 or more yrs. feeding in the sea. The loss of these heavy fish has materially decreased the total catch, which in 1941, for example, was about 60% less than in 1928. The grilse appear to have remained more or less constant since 1927. It has been suggested that the changes in the character of the runs of salmon into the River Shannon since the construction and operation of the hydro-electric plant were due to the destruction of the important spawning facilities for large salmon at Castleconnell and the transfer of spawning activities to a tributary of the Shannon which was noted for being the haunt of grilse prior to the erection of the hydro-electric plant.—Auth. summ.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 10943, 10950, 11207, 11227, 11805, 12219, 12238, 12262)

11266. Aldous, Shaler E. (U. S. Fish and Wildlife Serv., St. Paul, Minn.) Muskrat trapping on Sand Lake National Wildlife Refuge, South Dakota. *Jour. Wildlife Management* 11(1): 77-90. 2 fig. 1947.—The study shows that effective fall trapping is limited to a short period before the freeze-up. Trapper efficiency is much lower than winter trapping in houses or spring trapping. Fall skins are smaller and less prime, thus reducing their market value. Winter house trapping is an efficient method of harvesting where trapper techniques can be controlled. It permits a long period over which trapping can be continued, and the skins obtained are largely prime, of good size and demand good prices. House trapping, when properly done in this climatic zone, is not harmful to the muskrat population. Freezing out of houses is caused more by their location in shallow water and areas of poor food than by disturbance when house trapping. Healthy muskrats with a good food supply and access to it will not permit their houses to freeze up. Spring trapping is very productive, and the skins are both large and prime. However, a large proportion of the skins are damaged by

fighting animals, and proper spring trapping is limited to less than a month's duration. The muskrat population was in direct proportion to the abundance and distribution of good food plants. The winter house count is an excellent indicator of the muskrat population. The number of muskrats caught during both yrs. under heavy trapping pressure was directly proportional to the number of houses present. Male muskrats were more numerous than ♀♀ both in summer and in winter. Wt. and measurement of the 2 sexes showed no significant differences. Tagging studies indicated that muskrat movements were quite restricted between early fall and late winter.—S. E. Aldous.

11267. Baldwin, William P. (U. S. Fish and Wildlife Serv., McClellanville, S. C.) Trapping wild turkeys in South Carolina. *Jour. Wildlife Management* 11(1): 24-36. 1 pl., 1 fig. 1947.—Live-trapping, for restocking, 70 wild turkeys (*Meleagris gallopavo*) in coastal S. C. was done at cost of \$10 to \$100 per bird, depending on trap type, location, season. The best trapping time was Sept.-Oct., and best bait, chicken scratch feed. Automatic traps of poles with trench entrance and poultry netting with funnel entrance were inferior, in performance, to open-front netting traps manually operated from blinds; open-front traps, closing by curtains or wire panels, were inferior to dropnet traps. The latter were 15 X 20 feet canopy nets on pipe frameworks suspended 12 ft. above the ground, and released from a blind. For shipping live turkeys a light crate of cypress, plywood, poultry netting and burlap was designed, 3 of them fitting into body of half-ton pickup truck. For banding turkeys the No. 8 split-ring metal band issued by the U. S. Fish & Wildlife Service was satisfactory.—W. P. Baldwin.

11268. Carhart, Arthur H. Hunting North American deer. 232p. 16 pl., 4 fig. Macmillan Co.: New York, 1946.—Although the book is a popular account, written primarily for sportsmen, it is based in large part upon technical publications and manuscripts describing the many field investigations which have been carried out in recent years, particularly by State Game Departments under Federal Aid in Wildlife Restoration projects. The 17 chapters are devoted to: Introduction ("Our Heritage"), History ("Yesterday's Deer"), The Races of Deer, White-Tailed Deer, Black-Tail, and Mule Deer characteristics, record heads and wts., food habits of the various deer, interesting stories about deer, and 8 chapters on hunting, including special chapters on guns, equipment, methods of handling in the field to avoid meat spoilage, and methods of cookery. There are also instructions for preparing trophies for mounting. One chapter ("Good Hunting Tomorrow") is devoted to the game management methods which the author feels are essential to preserve the sport of deer hunting for future generations, and to the various factors which influence deer production. Included here are brief treatments of deer census methods, parasites, forage requirements, age and sex ratios, range surveys.—G. Swanson.

11269. Herman, Carlton M. (Div. Fish and Game, San Francisco, Calif.) Deer management problems as related to diseases and parasites of domestic range livestock. *Trans. North Amer. Wildlife Conf.* 10: 242-246. 1945.—Many diseases and parasites common to deer also occur in domestic range animals. High parasitic infections are known to occur in deer in the coastal counties of California. Since the stomach and intestinal roundworms found in these deer have a direct life cycle many larval worms are ingested by deer, cattle and sheep in normal grazing. Treatment with drugs has given only temporary relief to livestock whereas nothing has been done to combat parasitism in deer. The author suggests that (1) browse production be encouraged to attract deer away from cattle range lands, (2) the number of domestic animals in a particular grazing area be limited and (3) intermediate hosts, as in the case of the liver flukes, be controlled. It was concluded that more research is needed on wildlife diseases, especially the relationships of deer to livestock diseases. Cooperation between stockmen and conservationists is considered imperative if a control program is to be established.—J. R. Olive.

11270. Jensen, G. H., and L. J. Korschgen. (U. S. Fish and Wildlife Serv., Washington, D. C.) Contents of crops, gizzards and droppings of bobwhite quail force-fed known kinds and quantities of seeds. *Jour. Wildlife Management* 11(1): 37-43. 2 fig. 1947.—Known diets were fed

to bobwhite quail over a period of 3 days. The items of diet were then compared with the contents found in crops, gizzards and droppings. Comparison of wt. and volume methods gave essentially the same results. For this expt., crops provide the best material for determining the food habits of the quail, and droppings may be regarded as equal in value to gizzards. There is a possibility that the difference between the crop contents and gizzard contents might be used in field studies as an index of total digestible nutrient in food items but these should be correlated with digestibility trials for greatest accuracy.—G. H. Jensen.

11271. Johnson, C. S. Canada goose management. *Jour. Wildlife Management* 11(1): 21-24. 1947.—Reviews studies made at Michigan station in management of the Canada goose (*Branta canadensis*), in a 10-yr. period, 1936-46, during which time the species established a substantial breeding colony. Conclusive evidence was secured that locally bred birds moved down the Mississippi Flyway, returning to area of origin the following year. Observation of intolerance of nesting pairs to crowding, with optimum distribution of one breeding pair found to be not less than one-half acre of nesting territory.—C. S. Johnson.

11272. Lignon, J. Stokley. History and management of Merriam's wild turkey. *Univ. New Mexico Publ. Biol.* 1: 1-84. 19 pl., 2 fig. 1946.—Beginning with a treatment of the subspecific characters and characteristics of the Merriam or Mountain Wild Turkey (*Meleagris gallopavo merriami*), the author next passes to the early history and the life cycle and behavior of the bird. Detailed distribution is discussed, the natural range indicated by a map. The author follows contraction of the original range as well as restoration in both population and range, supporting his observations by a 2d map. Nesting and raising of young are adequately covered. Under the heading of Management, various factors are discussed which have a bearing upon depletion and maintenance of an adequate supply of birds. Important among these are population studies, food and feeding habits, mast crops and other natural foods, food analysis, predation, hunting, fire, trapping, and transplanting and artificial propagation.—E. F. Castetter.

11273. Linsdale, Jean M. The California ground squirrel. 475p. Frontispiece, illus. Univ. California Press: Berkeley, 1946. Pr. \$5.—The report is on research conducted intermittently on the California Ground Squirrel (*Citellus beecheyi*) for over 30 yrs. by the Museum of Vertebrate Zoology of the Univ. of California, chiefly on the Hastings Natural History Reservation in Monterey Co., Cal. Perhaps no such thorough local study of a wild mammal has ever before been written. The report is confined almost entirely to observations on the Reservation itself, so is not meant to be a comprehensive account of the species. Although the species is a very important economic pest in California, and is the subject of intensive poison campaigns to control its depredation, this report does not cover artificial control, but rather the squirrel under essentially natural conditions. Its ecology and habits are thoroughly described under chapter headings Habitat, Associated Vertebrate Animals, Communications, Mannerisms, Activity, Food, Diseases and Parasites, Reproduction, Numbers, Structure, and finally an extensive Summary and Conclusions and Bibliography. The chapter on Activity is particularly detailed for a wild rodent on such subjects as rhythm of daily activity and relation to temperature and weather, seasonal activity, including dormancy (hibernation and estivation), wts. and respiration. The chapter on diseases contains a detailed account of plague in ground squirrels and its relation to human plague infections. It continues with an account of the 9 protozoa, 3 cestodes, 4 nematodes, 2 anoplura, 7 siphonaptera, and 2 acarina which have been found on the ground squirrels of the Hastings Reservation. The account of reproduction is particularly detailed, occupying 60 pages.—G. Swanson.

11274. Lynch, John J. (U. S. Fish and Wildlife Serv., Washington, D. C.), Ted O'Neil (Louisiana Dept. Conserv.,

New Orleans), and Daniel W. Lay. (Texas Game, Fish and Oyster Comm., Rockport.) Management significance of damage by geese and muskrats to Gulf Coast marshes. *Jour. Wildlife Management* 11(1): 50-76. 4 pl., 3 fig. 1947.—Blue geese (*Chen caerulescens*), and lesser snow geese (*C. hyperborea hyperborea*) damage marsh tracts by their intensive feeding. Similar damage, locally referred to as "eatout", results when the Louisiana muskrat (*Ondatra zibethicus rivalis*) is allowed to overpopulate its habitat. This report describes details of this damage, outlines its ecological consequences, and suggests control measures. Effects of goose and muskrat "eatouts" upon fur, cattle, and wildlife management are summarized as follows: goose damage interferes with muskrat trapping and destroys cattle forage, but has some desirable outcomes that may be utilized in wildlife management. Muskrat damage is inimical to profitable fur management, and, while it may produce slight temporary wildlife benefits, it cannot be recommended on marshes dedicated to wildlife management.—J. J. Lynch.

11275. Martin, Lealon Jr. Can the whooping crane be saved? *Nat. Hist. [New York]* 55(9): 426-429, 436-437. 5 fig. 1946.—Although there are less than 100 Whooping Cranes alive in the world today, the National Audubon Society, the U. S. Fish and Wildlife Service, and Canadian Authorities are jointly sponsoring intensive field investigations of the bird throughout its whole range in an effort to save the species from extinction. Descriptions are given of the bird, and its habitat, courtship, and migration habits. Its near-extinction is due to its conspicuous coloration and habits which make it a target for gunners and its inclination quickly to desert molested nests.—G. H. Kelker.

11276. Meisinger, A. Wiedersehen mit dem "Grossen See". [The "big lake" seen again.] *Natur und Land* 33(1): 16-20. 1 pl. 1946.—Describes the present status of the avifauna of the Neusiedler Lake (Burgenland, Austria). It was found to have been impaired to some extent during the war, but not beyond possible recovery.—Max Onno.

11277. Meyer, Roland K., Cyril Kabat, and Irven O. Buss. (U. Wisconsin, Madison.) Early involutionary changes in the post-ovulatory follicles of the ring-necked pheasant. *Jour. Wildlife Management* 11(1): 43-49. 1 pl., 1 fig. 1947.—The post-ovulatory follicles of artificially-propagated pheasants involute rapidly within a period of 5 days after ovulation. Further involution is a very slow process and results in small pigmented structures which persist for at least 15 days post-ovulation. The involuting post-ovulatory follicle provides a basis for determining ovulation rates in artificially-propagated pheasants during the breeding season and provides a method for studying ovulation rates in wild pheasants as related to population problems.—R. K. Meyer.

11278. Taube, C. M. (Michigan State Coll., East Lansing.) Food habits of Michigan opossums. *Jour. Wildlife Management* 11(1): 97-103. 1 fig. 1947.—The stomach and intestinal contents of 52 opossums (*Didelphis v. virginiana*) caught in southern Michigan were examined. Animal foods comprised  $\frac{4}{5}$  of stomach contents, and plant foods  $\frac{1}{5}$ ; the proportions of the 2 types of foods were nearly equal in the intestines. Materials of animal origin in the stomachs included 49% mammal, 7% bird, 2% amphibian, 7% insect, 2% mollusk, and 8% annelid. The study indicated that the opossum in the region considered is much less of a predator than it had been popularly believed to be.—C. M. Taube.

11279. Young, J. Martin Jr. Life saving arrows. *Nat. Hist. [New York]* 55(9): 424-425. 3 fig. 1946.—Near Gunnison, Colorado, 4000 deer were feeding on 6 different areas in the winter of 1940-'41. To determine the number of animals which wandered from one feeding range to another, men marked about 50 deer of known age and sex on each area by shooting each one with an arrow tipped with a sponge-rubber soaked in an enamel paint. The results of the survey enabled the Colorado Game Dept. to predict how many deer would feed at each station and to make sure that an ample supply of food was available.—G. H. Kelker.





# BIOLOGICAL ABSTRACTS

Editor-in-Chief, JOHN E. FLYNN; Associate Editor, JEAN MACCREIGHT

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## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*  
(See also Entries 14852, 14853, 15481, 15495)

### PHILOSOPHY OF BIOLOGY

13222. Bryson, Lyman. *Science and freedom*. 191p. Columbia U. Press: New York, 1947. Pr. \$2.75.—The author postulates that freedom is a good, and believes it can be achieved by application of scientific method to thinking about human behavior. Scientific method requires the extracting from situations of certain general qualities, abstractly described, and making statements about entities which are ideal or imaginary. E.g., a doctor treating an earache makes use of highly generalized and abstract descriptions of earaches at large. Men can make progress toward building the kind of society they want by making use of abstract, generalized, and often numerically expressed facts about persons and institutions. In chapters on "The nature of social change", "Culture and social engineering", "The entities of social science", "Institutions", "Education", and "The good society", the author strives to lay a foundation for such scientific thinking about human behavior by working out "operational" and "univocal" definitions of terms which can be dealt with as entities in rigorous thinking. The "person" is the first such entity, operationally defined as a pattern of habits, or predictable behavior, with a marginal capacity for change, held together by memory. Social groups are patterns of interaction by means of habits that are shared. The 3 possible stages in the progress of a society toward freedom are global, where all individuals share the same habits and loyalties; mosaic, where there are numerous small global groups loosely held together; and pluralistic, where each individual is related to large numbers of differing groups, each in respect to one interest alone. Democracy is best developed in those places where the pluralism of patterns is taken for granted. Enlightenment is defined as "moderation in our loyalty to the culture by which we live, not because the culture is unworthy of loyalty but because there is positive value to humanity as a whole in a multiplicity of cultures in the world." A free society would have the greatest possible diversity of institutions and chances for loyal attachment, so that individuals would be able to change their individual patterns of loyalties without great cost or suffering. Since the world of nature, aside from man, can be understood and mastered by thinking on a series of levels of abstraction, this method can help also in mastering ourselves.

13223. King, Thomson. On life as a separate entity. *Sci. Month.* 64(2): 161-173. 1947.—As between the hypotheses (A) that there are 2 fundamental entities in the universe, matter and energy, and (B) that there are 3, matter, energy and life, the author concludes that the latter is correct; because the general properties of life, metabolism, reproduction, inheritance, variation, and evolution cannot be deduced from anything known about matter and energy apart from life; while the phenomena of the mind, observed in higher animals, are even less explicable.—H. F. Copeland.

13224. Williams, Roger J. (*U. Texas, Austin*). *Humanics: A crucial need*. *Sci. Month.* 64(2): 174-180. 1947.—A plea that very large funds be devoted to the scientific study of man for practical purposes, with the observation that the chief difficulty, both in understanding man and in dealing with him, is his enormous individual variation.—H. F. Copeland.

13225. Yancey, P. H. (*Spring Hill Coll., Ala.*) To see the foundation of life. *Bios* 17(4): 184-189. 1946.—Discussion of theories of life, from those of early man to the present time.—L. J. Gier.

### INSTITUTIONS, ADMINISTRATION

13226. Hatai, S. The Palao Tropical Biological Station. *Palao Trop. Biol. Sta. Stud.* 1(1): 1-15. 1937.—Description of the organization and its objectives.—E. D. Merrill.

13227. Stratton, F. J. M. International scientific co-operation. *Advancement Sci.* 3: 349-350. 1946.—A survey is given of the activities of the International Council of Scientific Unions.—*Courtesy Pl. Breeding Absts.*

13228. Tasnádi Jubacska, A. A Természettudományi Múzeum új élete. [The new life of the Hungarian National Museum for Natural Sciences.] *Természettudomány* 1(3/4): 38-44. 1946.—The author is the Director of the Museum for Natural Science. He reports on the devastation of the war, and on the restoration. As soon as military operations ended, the restoration and also research work began. The Botany Section suffered the greatest damage: the greater part of the famous herbarium and library burned. In the central building of the Nat. Mus. the Mineralogy Section (with one of the greatest mineral collections in Europe), and the Section of Geology and Palaeontology were also damaged. The building of the Museum for Natural Science suffered the least loss. The production of furniture and instruments is far advanced. In this building is housed the greater part of the Zoology Section, and the Anthropology Section, established in 1945. This last Section is concerned with the zoologists (phylogeny), the medical institutes (heredity), the ethnographers (race anthropology), archaeologists (prehistoric anthropology, race history), though its most important area of investigation is the anthropology of the Hungarian people. The leader of the Anthropology Section is J. Nemeskéri. The valuable skull collection had previously been in the Archaeology and Ethnography Sections of the National Museum. Laboratories for biochemistry, histology and bacteriology are organized within the Museum, in connection with the University and specialists of the Institute for Biological Researches in Tihany. Though there is great difficulty in carrying on research and publication, it is hoped that a volume of the *Annales Musei Nationalis Hungarici* will soon appear.—B. Balogh.

13229. Anonymous. Hawkesbury Agricultural College, Richmond, N. S. W. *Australian Jour. Dairy Technol.* 1(4): 150-151. 2 fig. 1946.—A description is given of the history, teaching and research work at the oldest agric. college in Australia.—E. Munch-Petersen.

13230. Anonymous. Scientific Research and Industrial Planning. *Advancement Sci.* 3: 286-333. 1946.—A full report is presented of the Conference on Scientific Research and Industrial Planning, organized by the British Association for the Advancement of Science, and held in London, Dec., 1945.—*Courtesy Pl. Breeding Absts.*

### MISCELLANEOUS

13231. Brues, Charles T. (*Harvard U., Cambridge, Mass.*) Contributions of entomology to theoretical biology. *Sci. Month.* 64(2): 123-134. 13 fig. 1947.—The fly

*Drosophila*, a chief natural agent of the dissemination of yeasts, has become a chief object of genetic study. The grasshopper *Brachystola magna* first showed that a certain chromosome conveys a certain character. Adaptation, a phenomenon explained by evolution, was long ago recognized in mimicry by insects. Insects exhibit suggestions of ortho-genetic evolution, clear cases of convergent evolution, and variation in rate of evolution, besides illustrating or being evidence for many other accepted features of evolution.—*H. F. Copeland*.

13232. Busch, R. (*Fac. Cienc. Exactas, Fisicas u Nat., Buenos Aires*.) Abundancia y distribución de los elementos

químicos en la naturaleza. [Abundance and distribution of the chemical elements in nature.] *Ciencia e Invest.* [Buenos Aires] 2(8): 323-328. 1946.

13233. Carlson, Fred A. (*Ohio State U., Columbus*.) *Geography of Latin America*. Rev. ed. 566p. Illus. Prentice-Hall, Inc.: New York. 1946. Pr. \$6.—This book covers the countries of South and Central America, Mexico, and the W. Indies. The discussion of each country includes a description of its physical features, climate, topography, etc. The agricultural resources and land use are described. For Brazil particularly, there is considerable discussion of insect danger, and of reptile, animal, and bird life.

## EDUCATION

F. R. KILLE, *Editor*

(See also in the section Apparatus and Technique; Visual Instruction in Microbiology, Immunology, and Public Health; and Entries 15466, 15476, 15485, 15498)

### GENERAL

13234. Gruenberg, Benjamin C. Teaching biology after the wars. *Amer. Biol. Teacher* 9(4): 101-104. 1947.—Science implies universal democracy. We should cut our instruction into units related to daily affairs already familiar to students. Students must learn to integrate by comparing, bringing out relationships, relating problems and methods to social conditions, and showing that contributions come from many nations, cultures, races and sects. Scientists alone speak an international language. Biology teaching may enlarge areas of mutual understanding.—*E. T. Cox*.

13235. McKibben, Margaret. (*Old Trail Sch., Akron, Ohio*.) Objectives in the teaching of biology. *Amer. Biol. Teacher* 9(4): 120-121. 1947.—An analysis of texts, courses of study, manuals, and magazines was made in respect to the expressed objectives in biol. teaching. The prevailing objectives are, in order of descending importance: economic value, general application to life problems, health, social adjustment, avocational interest, aesthetic appreciation, vocational interest, and prepn. for future work and study.—*E. T. Cox*.

13236. Quaintance, Charles W. (*Eastern Oregon Coll. Educ., La Grande*.) Term papers or term projects in biology? *Amer. Biol. Teacher* 9(4): 105-108. 1947.—The use of term projects instead of term papers in freshman biology classes brings more satisfactory results. Students choose a project from an extensive list and are provided with suggestions. Projects are demonstrated and are rated by a student committee trained in criteria. This learning by doing enriches traditional textbook work.—*E. T. Cox*.

13237. Wayne, Alan. (*Rhodes Sch., N.Y.C.*) The use of biography in teaching biology. *Amer. Biol. Teacher* 9(4): 118. 1947.—In the writer's experience it is very valuable to correlate generalizations, and expts. made by biologists with pertinent life experiences. This dramatizes and helps to inculcate the scientific attitude of a great researcher. It encourages student reading and reporting. 17 books are recommended as sources.—*E. T. Cox*.

13238. Weaver, Richard L. (*Audubon Nature Center, Greenwich, Conn.*) The introduction of natural resource

planning into our schools today. *Amer. Biol. Teacher* 9(4): 109-116. 7 fig. 1947.—Natural resource planning must be inclusive enough to encompass interests of most people, must be important and practical, and should start with local projects such as: an adequate park system, a school forest, a well-landscaped school yard, wildlife sanctuaries, stream management, etc. Sources of helpful literature in conservation planning and education are cited.—*E. T. Cox*.

### TEXTS

13239. Lutz, Louis. (*Fac. Pharm., Paris, France*.) *Traité de Cryptogamie*. vi+586p. 374 fig. Masson et Cie., Paris, 1942.—This general text book of cryptogamic botany is primarily for students of pharmacy, with emphasis on chemistry and medical mycology rather than taxonomy. The fungi, including myxomycetes and lichens, take up the greater part of the book, the algae, hepatics, ferns, mosses, Equisetae and Lycopodiaceae being only briefly discussed. All classes of fungi are reviewed in systematic order and the characters of the principal families and genera descr. and illustrated. The industrial applications of the fungi, their role in human and animal pathology and in plant diseases, mycorrhiza, toxicology of the mushrooms, and the chemistry of fungus pigments are among the wide range of subjects treated.—*E. K. Cash*.

13240. Prát, S. *Rostlina pod drobnohledem*. [The plant under the microscope.] 2d. ed. 206p. 82 fig. Unie: Prague, 1945.—An elementary textbook of practical microscopy, microscopical technique, and structural botany including histochemistry.—*S. Prát*.

13241. Swingle, Deane B. (*Montana State Coll., Bozeman*.) A textbook of systematic botany. 3d ed. 343p. illus. McGraw-Hill Book Co., Inc.: New York, 1946. Pr. \$3.50.—A new edition that presents a more satisfactory sequence of information, in that the brief accounts of special families now precedes the more abstract themes of Nomenclature, Principles of Taxonomy, Systems of Taxonomy, and The Literature of Systematic Botany. The work has been otherwise extensively rewritten, as is shown by its new preface making acknowledgment to 12 systematic botanists.—*F. W. Pennell*.

## BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 13225, 14570, 14571, 14572, 14573, 14574, 14575, 14830, 15001, 15067, 15222, 15227, 15879)

### HISTORY

13242. Ashley Montagu, M. F. (*Hahnemann Med. Coll., Philadelphia, Pa.*) Knowledge of the ape in antiquity. *Isis* 32(1): 87-102. 1 fig. 1940. (Publ. Jan. 1947).—Applying the word ape to all infrahuman primates except the Lemurs, W. C. McDermott in his *The Ape in Antiquity*, 1938, has collected data relating to the knowledge of apes possessed by the peoples of the Mediterranean basin, the ape in art, as a pet, as a source of humor, and as an evil beast. It is the most exhaustive treatment of the subject that has appeared (1940). Several inferences therein, however, are not justified: (1) Two silver bowls of Minoan-Mycenean age

(c. 700 B.C.) found at Cyprus, of Phoenician-Cypriote workmanship, are decorated with scenes described as "the hunting of deer and of a gorilla." That the gorilla was known in Cyprus, some 2600 miles from the nearest known range of that species and more than 2000 yrs. before *Troglodytes gorilla* was described by Savage and Wyman, 1847, is very improbable, since before that date, aside from the doubtful account of Hanno (5th Cent. B.C.), there are only 3 records of an animal that might have been a gorilla—Purchas, 1625; Monbodo, 1774; and T. E. Bowdich, 1819. Examination of the bowl in the Metropolitan Museum of Art, New York City, fails to confirm McDermott's claim. The figure was



more probably intended to represent a mythical monster, based on some knowledge of the baboon, *Papio hamadryas*. (2) McDermott attributes Agatharchides' statement that the womb of the sacred baboon of Egypt, *P. hamadryas*, hangs outside the body, to observation of a diseased animal. On the contrary, Agatharchides has probably given the first record of the sexual skin in primates. In the hamadryas baboon, especially, the perineal subcut. tissues are reddened and swollen to form a pendulous body apparently containing urogenital organs. (3) McDermott says that Aristotle's "pig-ape" cannot be identified. In fact, it is almost certainly *P. porcarius*, the pig-faced baboon, with its snout protruding above the upper lip, common in Africa south of the Limpopo River.—R. P. Bigelow.

13243. Barlow, Nora. (Edited by.) Charles Darwin and the voyage of the Beagle. 279p. Frontispiece. 2 maps. 14 pl. Philosophical Library: New York, 1946. Pr. \$3.75.—A series of 36 letters written by Charles Darwin to his family during the 5-yr. voyage of the Beagle plus excerpts from the 24 small notebooks that he compiled during the same period. Eight of the letters have been published in part in F. Darwin's *Life and Letters of Charles Darwin*. The others have not previously been published. The notebooks contain jottings from Darwin's diary. The letters are informal and intimate. In addition to purely family matters, they contain a light running account of the happenings on the voyage and of Darwin's emotional and intellectual reactions.—Conway Zirkle.

13244. Fletcher, H. O. Some strange interpretations of early discovered fossils. *Australian Museum Mag.* 9(1): 27-31. 1946.—A study of the history of life on earth during past geological periods has resulted in many interesting stories. Bones of mastodons have been mistaken for bones of giant men. The skeleton of a salamander from Baden, Germany, in 1726 was described as that of a child destroyed in the Flood. The footprints of a giant sloth, *Mylodon*, was thought to be that of a giant man.—R. H. Adams.

13245. Jacob, H. E. (*U. California Coll. Agric., Davis, Calif.*) Bread and man. I. Bread in the ancient world. II. The rivalry of the grains. III. Millers, bakers and the health of man. IV. Bread in the twentieth century. *Ciba Symposia* 8(9): 470-500. 1946.—A complete bibliography and a most exhaustive guide to the literature on bread is to be found in the author's volume, *Six Thousand Years of Bread*. (1944). From his wealth of information Jacob has selected many popular themes and written an interesting and well illustrated historical compendium.

13246. Johnston, Earl S. An establishment was established. *Jour. Washington Acad. Sci.* 37(2): 37-40. 1947.—Address of retiring president of Botanical Society of Washington. The year 1946 marked the 100th anniversary of the establishment of the Smithsonian Institution. Its origin is described and its early policies are set forth. Attention is called to the opportunities that exist for botanical research and study at the Institution.—E. S. Johnston.

13247. Kellaway, Peter. (*McGill U., Montreal, Canada.*) The part played by electric fish in the early history of bioelectricity and electrotherapy. *Bull. History Med.* 20(2): 112-137. 5 fig. 1946.—Three spp. of fish able to give severe electric shock—the electric ray, *Torpedo mamorata*; the Nile catfish, *Malopterurus electricus*; and the electric eel, *Gymnotus electricus*—are found near the sites of ancient civilization. The earliest known picture is of a catfish in an Egyptian tomb, ca. 2750 B.C. The earliest written reference to an electric fish is by Hippocrates. The shock of the torpedo is mentioned by Plato and by Aristotle. Theophrastus and Hero of Alexandria record its transmission. Cicero was the first to point out its defensive effect. Oppian, in the most precise of the early accounts, refers the origin of the shock to a definite part of the fish, a theory advanced 1300 yrs. later by Jerome Cardan, and proved experimentally in 1671 by Redi and in 1705 by Lorenzini. Galen first attempted to explain the numbing effect. Averroes (12th Cent.) compared the effect to that of the lodestone. Borelli (1685) ascribed the origin of the shock to rapid contraction of the electric organs, which he described as muscles. The ancients used fishes extensively in medicine and pharmacy. Hippocrates recommended the flesh of the torpedo in the diet of phthisic patients. Later under the influence of Roman and Oriental folk medicine, magical properties were attributed to fishes. Parts of all

kinds of fishes were used, as we learn from Pliny. Scribonius Largus (ca. A.D. 46) recommended the shock of the torpedo as a cure for headache and gout—the first recorded use of electrotherapy. Dioscorides recommended it also for prolapsus ani. In modern times there are 16th Century reports of the use of the shock of *Malopterurus* in Abyssinia, and instances of therapeutic use of electric shock from fishes appear in European literature up to about 1850.—R. P. Bigelow.

13248. Major, Ralph H. (*U. Kansas, Kansas City.*) War and disease. *Illinois Med. Jour.* 90(3): 162-170. 1946.—An historical retrospect of disease as a determining factor in the outcome of wars. Among the numerous instances especially noted are the following. During the Germanic Rome invasion the death of Marcus Aurelius and the defeat of his leaderless army was due to smallpox which destroyed entire legions. The "great plague" (bubonic?) destroyed both Pericles and his forces, dooming the Athenian Empire. The Mayans, as well as the invading Spaniards, were annihilated by yellow fever. During the Thirty Years War typhus and bubonic plague, the real victors, attacked Germany, Sweden and Austria. Germany lost from 1/2 to 2/3 of her population. Napoleon's Russian defeat was largely the result of typhus, typhoid and dysentery. The Union Army of the American Civil War lost 44,000 killed in battle while 186,000 died of disease, 36,000 from typhoid. During the Boer War the British lost 14,000 from preventable disease. There were 8,022 deaths from typhoid, more than the 8,000 killed by the Boers. A comparison of World Wars I and II shows improvements. Death rate in (1) Wounded I. 8.1%, II. 3.3%; (2) Meningitis I. 38%, II. 4%; (3) Pneumonia I. 38%, II. 0.7%; (4) Dysentery I. 1.6%, II. 0.05%; (5) Annual death rate per 1,000 for all diseases, excluding surgical cases, I. 15.6%, II. 0.6%.

13249. Mayr, Ernst. (*Amer. Mus. Nat. Hist., N.Y.C.*) The naturalist in Leidy's time and today. *Proc. Acad. Nat. Sci. Philadelphia* 98: 271-276. 1946.—A comparison of modern and early research fields. In Leidy's time nearly all fields of natural science were virgin territory. His research, published under > 600 titles, included protozoology, parasitology, paleontology and human anatomy. He had limitless new forms and structures to discover and little comparative literature. Conversely, the modern naturalist has little to describe but may build complex biological theories upon the basic work of pioneers. The old naturalist is dead, the specialist has taken his place. Specific examples are cited.—M. E. Phillips.

13250. Miller, Genevieve. (*Johns Hopkins U., Baltimore, Md.*) Medical education in colonial America. *Ciba Symposia* 8(10): 502-532. 1947.—An attractive historical survey covering the subjects of medical apprenticeship in the American colonies, the European influences in colonial medicine and medical schools in the colonies. Excerpts from the diaries of medical students and the early apprentice laws of New England, Pennsylvania and Virginia furnish the material for the first subject. Recorded indentures from Mass. and Va. show the legal apprentice contracts of young men apprenticed to physicians and copies of old certificates issued to apprentices who completed their contracts are extant. European influence was felt when numerous foreign born physicians settled in the expanding colonies. Scotland supplied the most—23, England 11, France 4, etc. to the Va. colony. Dr. John Kearsley, Sr., came to Philadelphia from England in 1711. In his office, sometimes called "the first medical college in America", were trained leaders of Phila. med. of the next generation. The brochure is illustrated by reproductions of paintings, portraits, views of buildings, and manuscripts. It is a worthwhile contribution to the history of medicine.

13250A. Nilsson, R. (*K. Lantrbrukshögskolan, Uppsala, Sweden.*) [Some chapters from the history of the development of microbiology.] [In Swed.] *Svensk Kemisk Tidskr.* 53: 112-122. 1941.—A review.

13251. Pledge, H. T. Science since 1500. A short history of mathematics, physics, chemistry, biology. 357p. 6 maps, 15 pl., 1 fig. Philosophical Library: New York, 1947. Pr. \$5.—A very condensed and relatively complete survey of the growth and development of the natural and exact sciences. The emphasis is upon mathematics, astronomy, physics and chemistry. The biological topics include biology before the microscope, microscopy, embryology.

systematics, evolution, cytology, genetics, growth and ecology. The history of each science is aimed primarily at the "specialist in other subjects". Review chapters summarizing the advances made during each century bring together the different sciences so that the scientific status of each period can be evaluated. Thus it is easy both to follow the history of each science and to trace the interrelations of the sciences.—*Conway Zirkle*.

13252. Proskauer, Curt. (11 Broadway, N.Y.C.) Oral hygiene. I. In the ancient and medieval Orient. II. In Greece and Rome. III. In the medieval Occident. *Ciba Symposia* 8(8): 438-468. 1946.—A history of oral hygiene profusely illustrated by reproductions of dental instruments, toilet sets with toothpicks, metal tooth crowns, brushes, fibers, etc., preserved in various museums. Supplementing these are related illustrations such as murals, sculptures, portraits, prints and title pages representing dentistry or allied subjects characteristic of the different historical periods covered. The Wellcome Historical Museum, London, the Amer. Museum of Natural History, New York, the Museum of the Univ. of Pennsylvania and the Cairo Museum, Egypt, have most of the articles depicted. Numerous refs. are given to manuscripts and publications supplying pictures or data. The narrative starts with the finding, at Ur of the Chaldees in a tomb of 3500 B.C., an Assyrian silver toilet set with a toothpick and a cuneiform tablet bearing 52 rules for cleansing the teeth. Egypt, the Mohammedan Empire, the Arabs, Hebrews, Chinese, Japanese, and Persians are reviewed. Greece and Rome are given special attention and the advances made by Etruscans. The *Regimen sanitatis* published in various places are the chief sources of medieval oral hygiene.

13253. Saunders, J. B. deC. M. (U. California Med. Sch., San Francisco), and Charles Donald O'Malley. (Stanford U., Calif.) The preparation of the human skeleton by Andreas Vesalius of Brussels. *Bull. History Med.* 20(3): 435-460. 2 fig. 1946.—This is an annotated translation of the 39th chapter, the penultimate one of Book I, of the *De humani corporis fabrica* (Basel, 1543) on the prepn. and articulation of the human skeleton. This chapter is of interest because it establishes a technique that remains today, and was the first writing in which a laboratory procedure is disclosed completely and in detail. Vesalius' recommendation that students prepare also skeletons of other vertebrates indicates his interest in comparative anatomy and bore fruit in the work of Belon (1553), Rondelet (1554, 1555), Salviani (1554), Coiter (1572), and Runini (1598). Although dissection had become fairly common by the beginning of the 16th century, it was limited by the need to preserve the body for Christian burial and by the decretal of Boniface VIII (1300) against boiling bones for easy transportation. It is not known how many skeletons Vesalius constructed. His first was obtained and boiled secretly at Louvain. This probably provided the model for the plates in the *Tabulae sex* of 1538. While in Bologna in the winter of 1539-40 he prepared a human and a simian skeleton. A 3d human skeleton he presented to the town of Basel in 1543 as a result of honorary association with the University. Of primary significance is the impetus which Vesalius gave to anatomy by his revolutionary procedures and demonstration of the value of the skeleton arrangement in teaching. His technique was rapidly adopted and became standard.—*R. P. Bigelow*.

13254. Schauer, G. K. Rosen und Tulipan, Lilien und Safran. Gartenlust von Gestern und Heute. [Roses and tulips, lilies and saffron. Garden joy of yesterday and today.] 120p. Rudolf M. Rohrer: Vienna, 1943.—Containing an historical survey of horticulture and garden flowers, beginning with the *Capitulare de villis* of 795. Rose, lily and saffron (*Crocus*) are treated in special chapters as to their history and symbolic significance. The wood cuts representing various garden flowers are taken from botanical works of the 17th and 18th Centuries. The printing of 12 colored plates was delayed by the war, and the book was preliminarily published without them.—*Max Onno*.

13255. Various authors. Das Kleine Buch der Tropenwunder. Kolorierte Stiche von Maria Sibylla Merian. Geleitwort von f. Schnack. [The Little Book of tropical marvels.] 54p. Leipzig.—The cuts of M. S. Merian, who traveled in the Tropics of Surinam from 1699 to 1701, representing flowers and fruits with insects and other animals

in a most careful, artistically perfect execution, are newly edited and accompanied by introductory words. Scientific determinations of the figured objects by H. Schnack and W. Kraus are added.—*Max Onno*.

## BIBLIOGRAPHY

13256. *Biochimica et Biophysica Acta*. Volume 1, Number 1, January 1947. Editorial Board: W. T. Astbury, A. Braunstein, C. F. Cori, Cl. Fromageot, K. Linderström-Lang, H. G. K. Westenbrink, and R. W. G. Wyckoff. Advisory Board: J. D. Bernal, J. Brachet, T. Caspersson, C. R. Harrington, A. J. Kluyver, H. A. Krebs, A. de Muralt, A. J. Oparin, J. Roche, M. Sreenivasaya, D. L. Talmud, A. Tiselius, and Hsien Wu. 100 pages (11 articles) in the first issue. Published by the Elsevier Publishing Company, Inc., Spuistraat 118b., Amsterdam C, Netherlands. Subscription price \$9.—The following papers comprise this issue: Investigation on the  $\beta$ -galactosidase of alfalfa seed emulsin, by S. Veibel and G. Østrup; Protéines de structure de Szent-Györgi et thymonucleohistone, by J. Brachet et R. Jeener; Photochemische Spaltung des Kohlenoxydmyoglobins durch ultraviolette Strahlung (Wirksamkeit der durch die Protein-komponente des Pigments absorbierten Quanten), by Th. Bücher und J. Kaspers; Séparations chromatographiques d'acides aminés et de peptides. I. Chromatographie de peptides neutres dans le formol à 10%, by E. Lederer et Tchen Pau Kiun; The distribution of the enzymes in resting cereals. I. The distribution of the saccharogenic amylase in wheat, rye, and barley, by Chr. Engel; Nouvelles études sur l'hydroxylsine, by P. Desnuelle et S. Antonin; Inactivation et réactivation complètes de la phosphomonoestérase alcaline et interchangeabilité des métaux actifs, by Nguyen-Van Thoai, J. Roche, et M. Roger; Die Spezifität der Mikromethoden zur Citronensäurebestimmung als Pentabromacetat, by F. L. Breusch und Rasim Tulus; Le dosage photométrique des nucléosides puriques et pyrimidiques au moyen de la réaction à l'orcine, by L. Massart et J. Hoste; On the synthesis of aneurinpyrophosphate from aneurin by blood, by H. G. K. Westenbrink and E. P. Steyn-Parvé; and Sur la détermination de quantités d'azote purique de l'ordre de 10 à 40 gammas. Application aux acides nucléiques, nucléoprotéides, tissus, microorganismes, by R. Vendrely.

13257. Geiser, Samuel W., and Bessie T. Geiser. A brief short-title list of published works on the history of science. *Southern Methodist Univ. Stud.* 1. 1-35. 1947.

13258. *Mémorial du Service d'Exploitation Industrielle des Tabacs et des Allumettes*. Volume 1, Series B, December 1945. 127 pages (2 articles) in the first issue. Published by the Institut Expérimental des Tabacs de Bergerac, Paris, France.—The following articles comprise this issue: Espèces tétraploïdes et hybrides interspécifiques amphidiploïdes et triples diploïdes de Nicotiana, obtenus par l'action de la colchicine, by A. Fardy and H. Hitier; and Étude de l'action comparée de la colchicine et de la nicotine sur les jeunes méristèmes d'*Allium cepa*, by A. Fardy and H. Hitier.

13259. *Produtos Animais*. Volume 1, Number 1, October 1946. Editor: E. F. Soares D'Albergaria. Director: E. Tropa. 340 pages (10 articles) in the first issue. Published by the Livraria Portugalia, Rua do Carmo, Lisbon, Portugal.—The following papers comprise this issue: Classificação das lãs Portuguesas em tipos fundamentais, by Mário Coelho Morais; Alguns resultados de análises de peles de bovinos, nacionais. I. Determinações físicas e químicas, by Maria Emília Rosendo Cabral, E. Tropa, and E. Albergaria; Lactologia contemporânea, by José Maria Rosell; Aperçu sur quelques problèmes scientifiques de la tannerie, by H. Brunner; Subsídios para o estudo físico-químico do leite da região de Aveiro, by Fernão Marques Abreu; Um processo novo para a análise quantitativa da gordura do leite. A técnica de lahay e cordier, by A. Marques; Acerca da importação de couros secos no último decénio (1936-1945), by E. Albergaria; Dados acerca da composição química e valor nutritivo dos ovos de galinha (*Gallus domesticus*), by E. Albergaria and E. Tropa; Resultados de análises de enlatados de carnes, nacionais, by E. Tropa and E. Albergaria; Introdução a técnica de algumas sementeiras microbiológicas, by E. Tropa and Salgado Valente; and informação económica, by E. Albergaria and Pedro M. Godinho.

13260. *Revue d'Agronomie Coloniale*. Volume 1, Num-

ber 1, 1944. Editorial Committee: Fred L. Hendrickx, Henryr Lebeau, Pierre C. Lefevre, G. E. Sladden, Ernest Stoffels, and Leon Joseph Colleaux. 64 pages (5 articles) in the first issue. Published by the Section Congolaise de l'Association des Ingénieurs sortis de l'Institut Agronomique de l'Etat à Gembloux, B. P. 104, Costermansville, Congo Belge.—The following papers comprise this issue: Esquisse de la végétation de Mfumburu, by F. L. Hendrickx; Note sur quelques insectes parasites de Manihot utilisissima Pohl. dans la région de Kasenyi (Lac Albert), by P. C. Lefevre; La récolte et le séchage du Pyrèthre, by G. E. Sladden; Les marais des régions montagneuses du Congo Oriental, by L. J. Colleaux; and Un réservoir de réception à siphon est-il nécessaire, au Kivu, dans une usine à café?, by P. C. Lefevre.

## BIOGRAPHY

13261. Bett, Walter R. William Thomas Green Morton (1819-'68). *Post-Grad. Med. Jour.* 22(252): 321-322. 1946.—A brief biography appropriate for the anesthesia centennial. Morton's greatest triumph took place at the Mass. Gen. Hosp., Boston, Oct. 16, 1846, when he publicly administered ether to a young printer, Gilbert Abbott. Morton was a neurotic individual, handicapped by lack of culture and scientific training. This sketch pictures his boyhood, irregular education, his erratic behavior, marriage, dental practice, association with the chemist-physician, Charles T. Jackson, from whom he learned about ether and its effects and concludes with his relatively early death at 48 from apoplexy.

13262. Brien, P. Le Lamarckisme de Paul Pelseneer. [The Lamarckism of Paul Pelseneer.] *Bull. Soc. Zool. France* 71(3): 134-140. 1947.—Discussion of the philosophical theories of the Belgian malacologist.—*Renaud Paulian.*

13263. Chandler, Asa C. (Rice Inst., Houston, Tex.) In Memoriam. Clarence John Addis, Jr. (1921-1946). *Jour. Parasitol.* 32(6): 585-586. Portrait. 1946.—An appreciation of this young scientist, prematurely dead from a brain tumor, who had been author or coauthor of 7 parasitological papers during his brief career.

13264. Dons, C. Vilhelm Storm. *K. Norske Vidensk. Selskab Forhandl.* [Trondhjem] 18: 28-44. 1 fig. 1945.—Biography of the Norwegian zoologist and botanist, with bibliography.—*O. A. Høeg.*

13265. Gilbert, René. Caludius Regaud (1870-1940). *Radiol. Clin.* [Basel] 10: 1-3. 1941.—Obituary of the eminent French histologist and radiobiologist who was a close friend of the late Prof. Marie Curie in Paris. He founded the "Fondation Curie".—*H. Simons.*

13266. Harris, Harry. An appreciation of Allan Brooks, zoological artist: 1869-1946. *Condor* 48(4): 145-153. 9 fig. 1946.—A discussion of his methods and style of painting, with reproductions of some of his bird paintings.

13267. Harris, Seale. Banting's miracle. [With a foreword by Elliott P. Joslin.] 245p. 23 pl. J. B. Lippincott Co.: Phila., 1946.—This is a biography of Frederick Banting, based on information obtained from those who knew him personally and from contemporary accounts of him. It follows him through boyhood and schooling, his experiences in the first World War, his struggles as an unsuccessful practitioner of medicine, and his difficulties in getting the pancreatic duct ligation research completed. His many difficul-

ties following the discovery of insulin until the time of his death in 1941 are dealt with at length.—*M. G. Netsky.*

13268. Lamont, Augusta. Anent a Scots explorer. Biographical sketch of Sir James Lamont of Knockdown. *Scottish Geogr. Mag.* 62(2): 76-78. 1946.—Inter alia, are given 21 names of more interesting arctic plants noted in Spitsbergen in 1869.—*C. E. Foister.*

13269. Menezes, Ostvaldo Bastos de. Brieger e sua escola de genética. [Brieger and his school of genetics.] *Bol. Soc. Brasileira Agron.* 9(1): 59-77. 2 pl. 1946.—This is a brief appreciation of the work of Prof. F. G. Brieger, and of the value of his school of genetics at the Agric. School of Piracicaba, S. Paulo, where he has been stationed since 1936. Included is a biographic sketch, a list of researches and publications, and outlines of his courses in statistics, genetics, and cytology.—*J. L. Carledge.*

13270. Pearson, A. A. Jakob E. Lange 1864-1941. *Mycologia* 39: 1-4. 1947.—The fifth and last volume of Lange's *Flora Agaricina Danica* was published in 1940 and the author died on Dec. 27, 1941. When a young man he had worked as a gardener and spent some time in Kew and Paris. Then he became a teacher in the Danish Agric. College where he remained for 30 years. He wrote books on botany and chemistry. In 1917 he took over the direction of the Smallholders School. Lange was also prominent in social and political movements. His main interest, apart from his professional activities, was the study of fungi and especially the agarics. A series of papers had appeared since 1914; these were so much appreciated by his countrymen that they got together sufficient funds to publish his paintings of the agarics. In 1935 appeared the first volume of *Flora Agaricina Danica* which when completed included over 1000 colored plates together with a text in English, giving short descriptions and keys to each genus. Lange's views on classification were conservative and he rarely departed from the Friesian taxonomy. His work has been of considerable service to students of the agarics.—*A. A. Pearson.*

13271. Possompès, B. Un précurseur du transformisme moderne: Maupertuis (1698-1759). *Bull. Soc. Zool. France* 71(3): 140-147. 1947.—Extracts from various publications of Maupertuis showing the importance of his views on evolution.—*Renaud Paulian.*

13272. Rozeira, Arnaldo. (Fac. Ciênc., Porto.) Gonçalo Sampaio como sistemata. *Broteria Ciênc. Nat.* 15(2): 49-55. 1946.—The systematic work of the Portuguese botanist Sampaio in phanerogams, lichens, and desmids was based primarily on morphology. Recent investigations in caryology, serology and genetics, applied to the Portuguese flora, demonstrate the correctness of Sampaio's classifications, as shown by the data on *Narcissus* and *Ranunculus* cited.—*E. K. Cash.*

13273. Wenrich, D. H. (U. Pennsylvania, Philadelphia.) In memoriam: Clarence Erwin McClung. *Stain Technol.* 21(2): 43-48. 1946.

13274. Anonymous. J. Émily. *Bull. Soc. Path. Exot.* 39(5/6): 131-132. 1946.—Obituary.

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13277. Anonymous. A. Watson Sellards. *Bull. Soc. Path. Exot.* 39(5/6): 135. 1946.—Obituary.

## EVOLUTION

ALFRED EMERSON, Editor

(See also: Maupertuis, 13271; Speciation and cytol. changes, Seshania, 13287; Speciation in Nicotiana, 13332; Inversion gradients and natural selection, Drosophila funebris, 13354; High mutant gene frequencies in a Drosophila population, 13368; Genetics of sexual isolation in Drosophila, 13371; Evolution of man, 13458; of the seed, 15235; Correlative evolution of plant and animal kingdoms, 14982; Evolutionary significance of the Pycnogonida, 16067; Phylogeny of Elasmobranchs, 16159; Head of fishes, 16160; Arctocebus (Lorisidae), 16217)

13278. Thienemann, A. (Hydrobiologische Anstalt, Plön, Germany.) Die Chironomidengattung Pseudosmittia und das Dollosche Gesetz. [The Chironomid genus Pseudosmittia and Dollo's law.] *Acta Biotheoretica* 7(3/4): 117-134. 4 fig. 1943.—Dollo's law of the non-reversibility of phyletic development applies to reduced and missing organs as well as to functioning ones which have adapted their shapes to new

conditions of life, and states that such an organ does not regain its old structure, even on the return of the old conditions. Numerous instances show that this law applies only in general; exceptions prove that it does not apply absolutely. 1) The larvae and pupae of Chironomidae live, with few exceptions, in water. Terrestrial spp. of the Chironomidae are undoubtedly descended from the aquatic spp. Of the Ortho-



cladiinae-genus *Pseudosmittia*, only spp. with terrestrial larvae were known until recently. The larva of *P. rutleri* has secondarily reverted to aquatic life. In them a number of the ancestral adaptations have remained intact, but 2 have again taken the form characteristic of aquatic adaptation. So here we have a return to the original phylogenetic state, as a result of the return of the original conditions of life. 2) The specific pupal organs of the Trichoptera, adaptations to aquatic life, have completely disappeared in the purely terrestrial *Enicocyla pusilla*, and have partly disappeared in the semi-terrestrial primitive Trichoptera of the genera *Beraea* and *Crunoscia*. The same holds true for 2 characteristics of the larvae. Here, also, we have a return to an original phylogenetic condition; in both cases, a "réversibilité de l'évolution".—*Auth. summ.*

13279. Weir, J. A. (*Iowa State Coll., Ames.*) A source of genes for evolutionary progress. *Genetics* 32(1): 111-112. 1947.—An abstract. The classical concept of progressive evolution of a sp. assumes either the occurrence of favorable mutations of genes which already possess vital catalytic functions or acquisition of new gene loci. The extreme improbability of a favorable mutation in an essential gene to produce a new vital function and the ultimate limit to increase in gene number imposed by the size of the nucleus render both views untenable. But this impasse can be met. Whereas an essential gene is inexorably confined by the vital

nature of its primary function, a neutral gene would be subject to no such restriction. It could mutate toward a new function without detriment to the host. It is hypothesized that neutral genes will arise whenever the end products of the species' own essential genes are substituted preformed as the result of the gene action of other forms which constitute the nutritional environment of the sp. A neutral gene is one which has lost its essentiality to the host and is therefore free to become incorporated in a totally different reaction chain. This hypothesis will account for the pyramidal parasitism found in nature. It does not demand an alteration in gene number since the sp. merely supplements its own gene activity with the products of genes found in other spp. In the process the sp. acquires neutral genes which are potential materials for evolutionary progress, but the number of loci remains unchanged. Man, at the vertex of parasitism, may have gained ascendancy by such a process.

13280. Wettstein, Fritz von. Artumwandlung, vor allem auch über die sogenannte Vererbung erworbener Eigenschaften. [Evolution, with particular reference to the inheritance of acquired characters.] *Jahrb. Preuss. Akad. Wiss. Phys.-Math. Kl.* 1940: 86. 1940.—A discussion, mainly emphasizing that evolution of adaptive organization (endoadaptation) can be fully explained on the theory of mutation and selection.—*H. Simons.*

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 13332, 13333, 13340, 13341, 13350, 13798, 13970, 13990, 14285, 14342, 14456, 14567, 15242, 15573, 15579, 15603, 15988, 15993, 15994, 16002, 16003, 16004, 16008, 16009)

### GENERAL

13281. Resende, F. (*Inst. Bot. Fac. Ciênc., Lisbon, Portugal.*) Sur la constitution histo-chimique probable de la olisthérozone nucléolaire. *Portugaliae Acta Biol. Ser. A* 1(3): 265-270. 1946.—A theoretical discussion of the composition of the nucleolar olisthérozone (name given by the author to the secondary constrictions where the nucleoli condense in telophase). This zone should possess a constitution similar to that of the nucleolus. The author supposes also that the nucleolar zone has a composition similar to that of heterochromatin but almost without thymonucleic acid. The "massues", described by Douteiligne and others, detaching from telophase chromosomes, would be prenucleolar substance. The author claims also that the small nucleoli produced by budding of the nucleolus during the growth of animal oocytes are comparable to the telophasic "massues".—*J. A. Serra.*

13282. Resende-Pinto, M. C. (*U. Porto, Portugal.*) Une nouvelle méthode de coloration des nucléoles—le anin-fer III. *Portugaliae Acta Biol. Ser. A* 1(3): 309-310. 1946.—A preliminary note in which the author claims that by hydrolyzing the tissues with HCl as for a Feulgen reaction, and coloring thereafter by the tannin-iron method of Salazar, the nucleolus, which usually does not take the tannin, becomes stainable.—*J. A. Serra.*

### PLANT

13283. Bacchi, O. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Citrus. III. Megasporogenese, fertilização e poliembryonia. [Cytological observations on Citrus. III. Megasporogenesis, fertilization and polyembryony.] *Bragantia* 4(7): 405-412. 1944.—A general review is presented of megasporogenesis, fertilization, endosperm formation and polyembryony in Citrus, most of the findings of Strassburger and Osawa having been confirmed through investigation of *C. paradisi* and *C. aurantium*. A new form of polyembryony is presented, caused by the existence in some instances of 2 gametophytes in the same ovule. The origin of 2 non-identical hybrids from the same seed is thus explained. Three forms of polyembryony are therefore known in Citrus: a) nucellar embryony, giving rise to a variable number of identical, "maternal" seedlings derived from the nucellus; b) cleavage polyembryony, originating through fission of the generative embryo; and c) polyembryony caused by the occurrence of > 1 normal gametophyte

in the same ovule. The endosperm in Citrus is free.—*Auth. summ.*

13284. Bacchi, O. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Citrus. VI. Resultados preliminares do efeito da colchicina sobre as sementes em germinação. [Cytological observations on Citrus. VI. Preliminary results on the effect of colchicine on the germination of seeds.] *Bragantia* 4(11): 679-691. 1944.—Seeds were immersed for 2, 3, and 4 hrs. in solns. with 0.015, 0.05, 0.15 and 0.5% colchicine. The treatments did not influence germination. Chromosome counts in root tips and the measurement of stomata gave the following results: a) Three plants (C.3, C.9 and C.15) had diploid and tetraploid roots and a tetraploid epidermis, to judge from stomatal area; b) one plant, C.12, besides being an hyperdiploid ( $2n = 19$  and  $20?$ ), had one root which was a chimera, in one of its cells approx. 38 chromosomes being counted. In spite of this chromosomal alteration, the epidermis of its leaves was of normal size, as in diploids.—*A. Grossmann.*

13285. Botelho, Magda, and A. J. Mendes. (*Inst. Bot. Fac. Ciênc., Lisbon, Portugal.*) Cariological studies on *Fritillaria lusitanica* Wickstr. I. *Portugaliae Acta Biol. Ser. A* 1(3): 310-312. 1946.—Secondary constrictions (olisthérozones) can easily be observed in the chromosomes of *F. lusitanica* and *F. l.* var. *stenophylla* at ordinary temps. These secondary constrictions are similar in all respects to the "special segments" observed by Darlington and LaCour (*Jour. Heredity* 32: 115) after cold treatment and are ordinary constrictions. Agglutination and pseudo-bridges have been found.—*J. A. Serra.*

13286. Conger, Alan D. (*Harvard U., Cambridge, Mass.*) Duration of prophase as an influence of chiasma frequency. *Genetics* 32(1): 83. 1947.—An abstract.

13286A. Eigsti, O. J. (*Northwestern U., Evanston, Ill.*) The pollen tube method for making comparisons of differences in mitotic rates between diploids and tetraploids. *Genetics* 32(1): 85. 1947.—An abstract. Studies on *Polygonatum pubescens* ( $n = 10$ ) and *P. commutatum* ( $n = 20$ ) are briefly reported.

13287. Jacob, K. T. (*U. London, Eng.*) Cytological studies in the genus *Sesbania*. *Bibliogr. Genetica* [Gravenhage] 13(3): 225-300. 105 fig. 1941.—*S. grandiflora* and *S. bispinosa* have  $2n = 24$ , and *S. sesban* and *S. speciosa* have  $2n = 12$ . The attachment of satellites to the nucleolus and the relation of nucleoli to secondary constrictions was studied.

In *S. grandiflora* small droplets staining like the nucleolus were observed at telophase on the surface of all the chromosomes. They are supposed to be derived from the matrix. Ring chromosomes were occasionally seen at mitosis in *S. speciosa* and *S. sesban*. The author also reports occasional disturbances of chromosome movement at mitosis, chromosome fragmentation, cytomixis between root tip cells, and cells with doubled chromosome numbers. He also observed somatic pairing in varying degree. Evidence of structural hybridity was found in all the spp. The evolution of the spp. is discussed.—G. Östergren.

13288. Jones, R. C. (*U. New Hampshire, Durham.*) The Feulgen reaction as a cytological technique with *Allomyces arbuscula*. *Mycologia* 39: 109-112. 1947.—A modified Feulgen technique has been used successfully in staining nuclei of *A. arbuscula*. Expts. were run to determine opt. conditions for fixation, hydrolysis, staining, and bleaching. After Feulgen fixation for 48 hrs. or Carnoy's B for 2 hrs., rinse in dist. water for 20-30 min.; in cold (room temp.) *n* HCl for 5 min.; in hot (58°C) *n* HCl for 5-7 min.; in cold (room temp.) *n* HCl for 5 min.; and in dist. water for 5 min.; stain in fuchsin sulfuric acid for 5-10 hrs. (or up to 24 hrs. without danger of overstaining); bleach in water containing SO<sub>2</sub> 30 sec. to 5 min.; rinse well in dist. water; dehydrate and clear: a) 5 min. each in 20%, 30%, 50%, 70% alcohols; b) 10 min. each in 85%, 95%, 100% alcohols; c) 5 min. each in 3 pts. alcohol, 1 pt. xylol; 2 pts. alcohol; 2 pts. xylol; 1 pt. alcohol, 3 pts. xylol; 100% xylol; mount in Canada balsam or clarite.—R. C. Jones.

13289. Krug, C. A., e O. Bacchi. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Citrus. II. Variedades triploides. [Cytological observations in Citrus. II. Triploid vars.] *Bragantia* 4(7): 393-403. 1944.—A review is presented of Citrus cytology and an account is given of the author's investigations on this subject. Two triploid Citrus vars. are described which are of economic importance. It appears probable that one of these is a nucellar seedling derived from the other. The morphological and cytological characteristics of these triploids are given in detail. Attention is called to the importance of triploidy in citrus breeding.—Auth. summ.

13290. Krug, C. A., e O. Bacchi. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Citrus. V. Poliploidia em relação à densidade e ao tamanho dos estomas em Citrus e outros gêneros das Aurantioideae. [Cytological observations in Citrus. V. Polyploidy in relation to the density and size of the stomata in Citrus and other genera of the Aurantioideae.] *Bragantia* 4(7): 429-447. 1944.—In material studied by Hirano, it was found that the density of stomata is governed by genetic factors other than chromosome number. From further studies with 36 diploid, triploid and tetraploid individuals of 5 spp. it was concluded that the detn. of stomata area may be useful to geneticists and plant breeders working with Citrus in distinguishing between triploids and tetraploids when the stomata area of the related diploids grown under identical conditions is known.—A. Grossmann.

13291. Krythe, J. M., and S. J. Wellensiek. (*Inst. Pl. Breed., Wageningen, Holland.*) Five years of colchicine research. *Bibliogr. Genetica* [Gravenhage] 14(1): 1-132. 1942.—A review of the literature on colchicine up to 1941-42, with a bibliography of 385 entries. It deals especially with the production of polyploid plants, but other aspects are also treated. The history of the subject is summarized and some properties of the substance described. The many ways of applying colchicine to plants are reviewed. Its cytological action is an inhibition of spindle formation. Chromosome division is not disturbed, but the daughter chromosomes are often included in a single nucleus thus giving tetraploidy. According to Dustin colchicine stimulates mitosis, but most investigators oppose this view. The influence on meiosis is reviewed. In connection with the effects of colchicine the morphological and physiological properties of polyploids are also considered. The action of colchicine on plant tumors and the interrelation of colchicine and various hormones are separately treated. Colchicine does not act on bacteria, yeasts, fungi and algae in the same way as on higher plants. It has a primary action on animal cells analogous to that on higher plants, but induction of permanent polyploidy in animals is difficult. Chimeras of diploid and polyploid tissue

are often formed in plants by colchicine treatment. Colchicine has been used to study the mechanism of sex detn. in dioecious plants. The direct practical value of artificial polyploids has been overestimated. The new polyploids must be improved by crossing and selection. Fertile amphidiploids are of more practical value than autotetraploids. An action more or less similar to that of colchicine has been found in 47 other substances listed by the authors. Permanent polyploidy has been induced by only growth substances and acenaphthene. The spp. treated by colchicine are tabulated, amounting to 243 in 137 genera. The amphidiploids produced are also tabulated. They represent 40 spp. crosses in 11 genera and 3 intergeneric crosses.—G. Östergren.

13292. Mendes, A. J. T. (*Inst. Agron., Campinas, Brazil.*) Observações citológicas em Coffea. VIII. Poliembrionia. [Cytological observations on Coffea. VIII. Polyembryony.] *Bragantia* 4(12): 683-708. 1944.—Polyembryony, embryoless seeds and double embryo-sacs occur in the genus *Coffea*. Di- and tri-embryonate seeds have been met with in *C. arabica*, *C. canephora*, *C. excelsa*, *C. liberica* and a hybrid between *C. arabica* and *C. canephora*. In the var. Bourbon the frequency, based on 9,453 seeds examined, was 0.8%. Embryoless seeds were seen only in *C. arabica* var. Bourbon; their frequency was 1.2%. Various cases of formation of double embryo-sacs were found in *C. arabica*, with a frequency of 2.27%. Polyembryony here is probably a consequence of this phenomenon. A cytological examination of 72 seedlings raised from polyembryonic seeds of *C. arabica*, including 3 triplets, 48 twins and 21 others whose mates were not examined, showed that all had  $2n = 44$ , this being the somatic number of the species.—Auth. summ.

13293. Mendes, E. J. (*Inst. Bot. Fac. Ciênc., Lisbon, Portugal.*) Mitosis in the spermatogenous threads of *Chara vulgaris* L. var. *longibracteata* Kütz. *Portugaliae Acta Biol. Ser. A* 1(3): 251-264. 1946.—Mitosis in the spermatogenous filaments of this form shows some peculiarities in respect to its synchronism in all the cells of the young filaments or in more or less long segments of older threads, and also in respect to the position of the spindle, which is oblique to the filament's long axis. The author disputes the interpretation previously given by Geitler that the mitotic synchronism is due to the effect of mitotic hormones spreading from the capitulum. At the end of the division cycles 3 different thicknesses of the cell membranes are seen in the spermatogenous filaments. The oblique position of the spindle is explained as due to lack of space in each cell sufficient for the development of a spindle along the filament's long axis. The apical cell, which is longer, usually shows normal (not oblique) spindle. The number of chromosomes is 14. Oospore nuclei and the reduction division have not been observed.—J. A. Serra.

13294. Neto, Ernesto de Miranda. Número de cromossomos no gênero *Hippeastrum* Herb. [Number of chromosomes in the genus *Hippeastrum*.] *Bol. Soc. Brasileira Agron.* 8(4): 383-389. 1 pl. 1945.—In *H. calyptratum* and *H. stilosum*,  $2n = 22$ ; in *H. reginae*,  $2n = 38$ . The last probably represents a natural triploid hybrid between a diploid and a tetraploid species.—J. L. Carledge.

13295. Pinto-Lopes, J. (*Inst. Bot. Fac. Ciênc., Lisbon, Portugal.*) Cariological studies on the Aloinae. IV. Chromosomic set and chromatic agglutination of the species of the section *Coarctatae* of the genus *Haworthia*. *Portugaliae Acta Biol. Ser. A* 1(3): 187-234. 1946.—A comparative study of the chromosome numbers of 17 spp. (30 spp. and subsp. of *Haworthia*), including 25 forms newly investigated, is reported. Only 4 spp. of the section were unavailable. All the others were studied. Details are given on the stickiness of the chroms. in the plants studied and its interpretation. Fixation was by Carnoy and coloration by Feulgen or acetocarmine. The chromosome set of each sp. is figured and described. The basic no. is 7. 14 chroms. were found in *H. kewensis*, *lisbonensis*, *reinwardtii* (vars. *minor*, *adelaidensis*, *fallax*, *major*, *triebnerii*), *herrei* (var. *poellnitzii*), *jonesiae*, *jacobsoniana* and *eilyae* (vars. *zanthreana*, *poellnitziana*). 21 chroms. were found in: the spp. *H. reinwardtii* (var. *archibaldiae*) and *resendeana*. 28 chroms. in the spp. *H. reinwardtii* (vars. *conspicua*, *fallax*, *chatwinii*, *haworthii*), *coarctata* (var. *haworthii*, forma *pseudocoarctata*), *greenii* (formae *bakerii* and *minor*), *carrisoii* and *glauca*. 35 chroms. in: *H. brotereana*, *rubrobrunea* and *rewendetii*. 36 chroms. are found in *H. sampaiana* and 42 chroms. in *H. coarctata*

(vars. *haworthii* forma *major*, and *krausii*), *armstrongii* and *herrei* (var. *depauperata*). These spp. form a natural polyploid series with  $2n$ ,  $3n$ ,  $4n$ ,  $5n$ , and  $6n$  chroms., with the exception of the form with  $36 = 5n + 1$ . Chrom. number, polyploidy and plant morphology are not visibly correlated with systematic position or category. Chromosome stickiness (= agglutination) has been observed in many forms in meta- and anaphase, and pseudo-bridges (due to coalescence of the matrix) have also been found. Aspects, which previous authors sometimes attributed to bad fixation, perhaps arise because of stickiness of the chrom. karymma. Other cases are evident agglutinations and pseudo-bridges. True bridges, with fusion of chromatid ends or the distension of one chromatid, are found in root tip meristems. Fragments have been observed which have probably resulted from these true bridges. No attempt is made to account for the origin of true bridges. Pseudo-bridges possibly cause fragmentation when strong agglutination occurs. Micronuclei were observed in the form with  $5n + 1$  chroms., resulting from retarded chroms. in sticky roots. The extensibility of different chrom. regions is discussed; as expected, the zones more heavily charged with matrix are the less extensible. Agglutination has not been causally related to any external or internal factor.—J. A. Serra.

13296. Resende, F., e Pedro da Franca. (Inst. Bot. Fac. Ciênc., Lisbon, Portugal.) Sur l'origine de nouvelles formes. II. *Portugaliae Acta Biol. Ser. A* 1(3): 289-307. 1946.—A plant of *Haworthia browniana* possessed, instead of one of the 6 small chromosomes normally present in the Aloinae, an isobrachial chromosome. This isochromosome probably originated through irregular division of the centromere at meiosis of a small chromosome. The karyotype has been under observation for 5 yrs. and has always remained constant (root meristems). Only a single shoot of this sp. could be observed. Viability is excellent and the phenotype does not show any peculiarity. The greater length of each half of the isochrom. in relation to the small chroms. would not be due to duplications or translocations, but rather to a different distension of the chromonemata. In 2 of the 11 plants of *Dipcadi serotinum*, accessory fragments were observed. Normally there are only small chromocenters. The number of fragments varies between 8-16 and they are always heterochromatic, giving rise to chromocenters. During mitosis agglutination of the fragments causes their irregular distribution to the 2 poles. The fragments show a greater chromatic agglutination (stickiness) than the euchromatic chroms. The hypothesis that these accessory fragments are parasitic in nature is advanced.—J. A. Serra.

13297. Rhoades, M. M. (Columbia U., N. Y. C.) Crossover chromosomes in unreduced gametes of asynaptic maize. *Genetics* 32(1): 101. 1947.—An abstract.

13298. Riley, Herbert Parkes. (U. Kentucky, Lexington.) Chromosome studies in a hybrid between *Gasteria* and *Aloe*. *Genetics* 32(1): 102. 1947.—An abstract.

13299. Sax, Hally J., and Karl Sax. The cytogenetics of generic hybrids of *Sorbus*. *Jour. Arnold Arboretum* 28(1): 137-140. 1 pl. 1947.—Cytological studies of natural hybrids between *Sorbus* and the related genera *Aronia*, *Amelanchier*, and *Pyrus* show considerable meiotic irregularity and gametic sterility. The hybrids between *Sorbus* and *Aronia* are relatively sterile, but many of the  $F_2$  segregates are viable for only a short time. The cytogenetic analysis indicates a common origin, followed by considerable genetic diversity.—Karl Sax.

13300. Schussnig, B. Der Kernphasenwechsel von *Cladophora gracilis*. [Nuclear behavior in Cl. gr.] *Biol. Gen. [Vienna]* 14: 129-144. 1 pl. 1939.—The following chromosome numbers were found:  $2n + x + y = 24$ ;  $n + x = 12$  or  $n + y = 12$ ,  $x$  and  $y$  being sex chromosomes. The gametes ( $x = \varnothing$ ,  $y = \sigma$ ) are slightly anisomorphic, representing a transition from isogamy to anisogamy. Thus *C. gracilis* follows the *Sphaerocarpos* type of *Lorbeer* and appears to have a genotypic dioecism like *C. suhriana*. Centrioles were found in reductional and gametangial divisions, but never in somatic ones. They agree in number with the basal granules (diploid 2, haploid 1).—Max Onno.

13301. Smith, Ben W., and Mary Thompson Smith. (North Carolina State Coll., Raleigh.) Sex chromosomes in *Rumex hastatus* Baldw. with  $XY_1Y_2$  pairing. *Genetics* 32(1): 104-105. 1947.—An abstract.

13302. Sparrow, A. H. (Harvard U., Cambridge, Mass.) Changes in sensitivity of chromosomes to x-ray breakage during microsporogenesis. *Genetics* 32(1): 106-107. 1947.—An abstract. A sensitivity curve has been constructed for changes in radiosensitivity of *Trillium* chromosomes. The data show a gradual increase of sensitivity from early meiotic prophase up to metaphase I. The range of sensitivities is large (about 1 to 27) and high and low sensitivity stages, respectively, correspond to stages of high and low conc. of desoxyribose nucleic acid in the chromosomes.

13303. Sparrow, A. H., and Marian Reese Hammond. (Harvard U., Cambridge, Mass.) Desoxyribonucleic-acid-containing bodies in the cytoplasm of pollen mother cells at early meiotic prophase. *Genetics* 32(1): 107. 1947.—An abstract. Feulgen-positive bodies are present in the cytoplasm of pollen mother cells in several genera of plants (*Lilium*, *Trillium*, *Allium*, *Paeonia* and others). It is suggested that they may function as a modification of the more common type of heterochromatin-nucleolus mechanism controlling nucleic acid synthesis.

13304. Subramaniam, M. K. (Indian Inst. Sci., Bangalore.) Studies on the cytology of yeasts. I. Mitosis in *Saccharomyces cerevisiae*. *Proc. Nation. Inst. Sci. India* 12(3): 143-149. 35 fig. 1946.—Material from rapidly growing cultures in wort was smeared, treated with  $NH_4OH$  vapor for 10-15 sec., fixed in Carnoy's or Bouin, and stained in Heidenhain's hematoxylin. Two chromosomes develop out of a central chromatin mass, and split, each daughter nucleus receiving 2 chromosomes. The "Feulgen negative chromosomes" described by other workers are considered to be mitochondria.—R. E. Cleland.

13305. Swanson, C. P. (Johns Hopkins U., Baltimore, Md.) A consideration of the structure of the prophase chromosomes in the pollen tubes of *Tradescantia*. *Genetics* 32(1): 109. 1947.—An abstract.

13306. Swanson, C. P., and Alexander Hollaender. (U. S. Publ. Health Serv., Bethesda, Md.) The frequency of X-ray-induced chromatid breaks in *Tradescantia* as modified by near infrared radiation. *Proc. Nation. Acad. Sci. U. S. A.* 32(12): 295-302. 1946.—Expts. are reported in which it has been shown that near infra-red radiation, when combined with x-rays, significantly increases the frequency of x-ray-induced breaks and rearrangements in the microspore chromosomes of *Tradescantia*. All types of detectable alterations are increased by pre-treatment, while post-treatment increases the frequency of single deletions and exchanges but does not increase the frequency of double deletions. A delay of 21 hrs. between pre-treatment with infra-red and x-rays does not appreciably decrease the effectiveness of infra-red, suggesting that the change induced by infra-red is of a relatively permanent nature. The nature of the effect of infra-red is poorly understood.—Auth. summ.

13307. Wilson, G. B. (Dept. Agric., Jamaica, B. W. I.) Cytological studies in the Musae. II. Meiosis in some diploid clones. *Genetics* 31(5): 475-482. 1946.—Meiosis was studied in 18 diploid *Musa* clones representing the 4 spp., *Musa acuminata*, *M. rubra* (?), *M. balbisiana* and *M. nagenium*. All but 3 of these clones were found to be normal in pairing (11 $\mu$  regularly) and in subsequent segregation. The aberrant types of *Zebrina* "E" (*M. acuminata*) which displayed a tendency to asynapsis in 1 to 7 chromosome pairs; Pisang Lilan (*M. acuminata*), a reciprocal interchange hybrid, and Philippine unidentified (*M. balbisiana*) which showed a tendency to have one asynaptic chromosome pair. All diploids examined tend to give haploid gametes so that the tetraploids typically resulting from the cross Gros Michel ( $2n = 33$ )  $\times$  *M. acuminata* ( $2n = 22$ ) must be assumed to carry the complete Gros Michel complex.—G. B. Wilson.

13308. Wilson, G. B. (Dept. Agric., Jamaica, B. W. I.) Cytological studies in the Musae. III. Meiosis in some seedling clones. *Genetics* 31(5): 483-493. 3 fig. 1946.—Meiosis was studied in 4 tetraploid ( $2n = 44$ ) *Musa* families resulting from the general cross Gros Michel ( $2n = 33$ )  $\times$  *M. acuminata* ( $2n = 22$ ). In all cases pairing was relatively complete with a tendency toward the formation of 4 $\mu$  and 14 $\mu$ . From this and other information it was concluded that Gros Michel is closely related to the *acuminata* series. Meiosis was also studied in 3 diploid seedlings resulting from the same general cross. Pairing and subsequent segregation was found to be normal. Such seedlings probably consist of



1 set of Gros Michel plus 1 set of *M. acuminata* chromosomes. These seedlings appear to be highly fertile and are, therefore, of potential importance in breeding new commercial types.—*G. B. Wilson.*

# ANIMAL

13309. Bieseke, John J. (*Massachusetts Inst. Tech., Cambridge.*) The size of somatic chromosomes at different ages in the rat. *Jour. Gerontol.* 1(4): 433-440. 1946.—Metaphasic chromosome vol. in acetocarmine smears varied from organ to organ (cell type to cell type) and from age to age in 44 Wistar albino rats. The variability among the organs was least in the embryos and greatest in the old animals. There were roughly 3 patterns of change with age: Chromosome size varied little in epidermis and nonepithelial cells of the lung; a rise in chromosome size at birth, followed by a fall in youth and a lower level in maturity, was found in small intestine epithelium, lymph node, and spleen; an increase from the embryonic volume to a larger size soon after birth and maintained or augmented in maturity and old age, occurred in chromosomes of kidney and liver. It appeared that chromosome volume was more likely to change when the cell was differentiating or modulating, and that it would shift in accordance with quant. changes in chromosomal functions. The data did not give clear indications of important alterations of chromosome size in senility.—*J. J. Bieseke.*

13310. Brachet, J., et R. Jeener. (*U. Brussels, Belgium.*) Recherches sur des particules cytoplasmiques de dimensions macromoléculaires riches en acide pentosenucléique. I. Propriétés générales, relations avec les hydrolases, les hormones, les protéines de structure. [Researches on cytoplasmic particles of macromolecular dimensions, rich in pentose-nucleic acid. I. General properties, relations to hydrolases, hormones, and structural proteins.] *Enzymologia [Hague]* 11: 186-212. 1943-1945.—By ultracentrifugation of water extracts of different organs of the rabbit, rat and mouse, of yeast cells and of amphibian eggs, particles of common chemical composition may be isolated. Histochemical and chemical investigations have revealed the presence of ribonucleic acid, protein-SH groups, plasmalogen, indophenol-oxidase and peroxidase. Glycogen and thymonucleic acid are absent. The particles obtained from yeast do not contain plasmalogen. These particles can be thrown down by ultracentrifuging living cells. A comparison made between normal frog liver and ultracentrifuged frog liver reveals that the particles retain their histochemical properties. In adult organs, the whole of the ribonucleic acid extractable with phosphate buffer *M*/200, pH 7.3, is bound to the particles. This is not the case in yeast and amphibian eggs. Different hydrolases (alkaline phosphatase, ribonuclease, amylase, dipeptidase, cathepsin, trypsin, arginase, adenylic acid deaminase) are partly bound to particles. It is assumed that this might lead to a revision of the distinction between lyo- and desmoenzymes. Hemoglobin, insulin and the melanophore hormone have been found in the particles from erythrocytes, pancreas and pituitary, respectively. No direct relationship between the particles and the structure proteins of Szent-Györgyi was found. It is assumed that the nucleic acid of these proteins arises from the particles.—*E. L. Massari.*

13311. Crouse, Helen V. (*U. Pennsylvania, Philadelphia.*) The induction of aberrant chromosome elimination in *Sciara* males. *Genetics* 32(1): 83-84. 1947.—An abstract.

13312. Federley, Harry. Zur Zytologie einer semisterilen Population von *Pygaera pigra*. *Acta Zool. Fennica* 35: 1-20. 16 fig. 1942.—Only 68.9% of 235 fertilized eggs produced living larvae. On the supposition that lethal factors were present, several larvae were studied cytologically. *n* = 23 was found to be the characteristic chromosome number. Spermatogenesis showed anomalies due to non-disjunction, asynapsis and oligosynapsis. Tetraploidy due to restitution nuclei and aneuploidy was not rare. A detailed analysis of the genotype was not given.—*W. Rosén.*

13313. Gaulden, Mary Esther (*Nation. Inst. Health, Bethesda, Md.*), and J. Gordon Carlson. (*U. Alabama, Tuscaloosa.*) Action of different concentrations of colchicine on spindle formation and chromosome arrangement as revealed in the living cell. *Genetics* 32(1): 87. 1947.—An

abstract. Studies on the neuroblasts of the grasshopper embryo, growing in culture, are reported.

13314. Gowen, John W., and Marie S. Gowen. (*Iowa State Coll., Ames.*) Constitution of the second chromosome of *Drosophila melanogaster* as indicated by x-ray analysis. *Genetics* 32(1): 89. 1947.—An abstract.

13315. Hartung, Ernest W. Jr. (*U. Vermont, Burlington.*) Cytological and experimental studies on the oocytes of fresh water pulmonates. *Biol. Bull.* 92(1): 10-22. 6 fig. 1947.—The oocytes of *Lymnaea stagnalis oppressa* and of *Physa gracilis* were studied cytologically following Champy fixation and stain, and experimentally by centrifugation and X-radiation. The cytological studies revealed differences in the pattern of distribution of visible inclusions that are specific and constant within each species, but differ between species. The constancy of pattern within the ovarian oocytes was tested in both spp. by centrifuging entire snails. Displacement and stratification of the visible cellular inclusions in the oocytes was produced, but no aberrations in subsequent development resulted. It is concluded that a fundamental ground substance is present in the oocyte which is not affected by the stratification of visible inclusions. The manner in which the inclusions migrated from their artificially induced stratified locations was observed, and it is postulated that the ground substance of the oocyte of *Physa* is in a more fluid state than that of *Lymnaea*. Further tests on the constancy of pattern were made by exposure of snails of each spp. to varying dosages of X-radiation and study of the development of eggs laid by them subsequently. As dosage increased there was a decrease in the number of eggs completing their embryonic development, but no decrease was noticed in the number of eggs that were able to initiate their development. It is concluded that the cytoplasmic pattern or ground substance inherent in the oocyte is unaffected by X-radiation of dosage values below killing intensity.—*E. W. Hartung, Jr.*

13316. Kaufmann, Berwind P. (*Carnegie Inst. Washington, Cold Spring Harbor, N. Y.*), Alexander Hollaender (*Nation. Inst. Health, Bethesda, Md.*), and Helen Gay. (*Carnegie Inst. Washington, Cold Spring Harbor, N. Y.*) Modification of the frequency of chromosomal rearrangements induced by X-rays in *Drosophila*. I. Use of near infrared radiation. *Genetics* 31(4): 349-367. 1946.—Modification of the frequency of X-ray-induced chromosomal rearrangements detected by analysis of the salivary-gland chromosomes of *D. melanogaster* was effected by the use of near infrared radiation ( $\lambda$  ca. 10,000 Å). Post-treatment of ♂♂ with near infrared accelerated the mitotic processes that make cells that were not mature sperm at the time of X-ray treatment available for transfer in copulation. Pretreatment with near infrared increased significantly the frequency of detectable X-ray-induced rearrangements as compared with the X-rayed controls. The higher frequency is not attributable to selective sensitization of any particular chromosome or portion thereof. Determination of hatchability of eggs deposited by ♀♀ that had been inseminated by ♂♂ exposed successively to near infrared and X-ray radiation suggests that pretreatment does not modify greatly the frequency of dominant lethals. Various possible modes of action of the near infrared radiation are considered.—*Authors.*

13317. Kaufmann, Berwind P. (*Carnegie Inst. Washington, Cold Spring Harbor, N. Y.*), and Alexander Hollaender. (*Nation. Inst. Health, Bethesda, Md.*) Modification of the frequency of chromosomal rearrangements induced by X-rays in *Drosophila*. II. Use of ultraviolet radiation. *Genetics* 31(4): 368-376. 1946.—U.v. radiation ( $\lambda$  2537 Å) used subsequent to X-rays in the treatment of the spermatozoa of *D. melanogaster* effected a decrease, as compared with the controls receiving an equivalent dose of X-rays, in the frequency of chromosomal rearrangements. About 19% of the eggs failed to hatch that were deposited by ♀♀ that had been inseminated by ♂♂ treated with  $\lambda$  2537 Å, as compared with 7% in untreated controls. The difference between the 2 groups is attributable to induction by the u.v. of the single-break type of dominant lethal. Other studies of hatchability of eggs deposited by ♀♀ that had been inseminated by ♂♂ treated with either 2000 r of X-rays, or 2000 r +  $\lambda$  2537 Å suggest that the effect of post-treatment in reducing the frequency of chromosomal rearrangements is attributable to increased restitution rather than to an increase

in the frequency of the single-break type of chromosomal de-arrangement.—*Authors.*

13318. Kaufmann, Berwind P. (*Carnegie Inst. Washington, Cold Spring Harbor, N. Y.*) Modification of the frequency of chromosomal rearrangements induced by X-rays in *Drosophila*. III. Effect of supplementary treatment at the time of chromosome recombination. *Genetics* 31(5): 449-453. 1946.—Eggs deposited by ♀♀ of *D. melanogaster* that had been inseminated by ♂♂ previously treated with 4,000 r of X-rays were exposed to near infrared radiation ( $\lambda$  ca. 10,000 Å) during the period of syngamy and early cleavage. A statistically significant increase, as compared with the effect of temps. in the range from 18° to 28°C, was obtained in the frequency of chromosomal rearrangements detected by analysis of salivary-gland nuclei. The action of the near infrared in facilitating recombination among the breaks induced by the X-rays is attributed to selective action on certain cellular components rather than to an extension of the range of temp. within which fertility and viability may be maintained.—*B. P. Kaufmann.*

13319. Kodani, Masuo. (*U. Rochester, N. Y.*) Variations in the terminal bands of the salivary X-chromosome of *Drosophila melanogaster*. *Genetics* 32(1): 18-28. 1947.—A few terminal bands in the X-chromosome of the salivary gland nucleus appear to be absent in some mutant and wild stocks of *D. melanogaster*. These bands were found to be actually present at the end of the X-chromosome, but are closely apposed to the more proximal band and do not appear as separate individual bands in the aceto-orcin smear prep. Some or all of these bands appear as independent bands when the chromosome tip is paired. A chromosome tip may influence the tip of its pairing partner so that the hidden bands may appear. The tips of some stocks exert a greater influence of this sort on the tips of the partner chromosome than those of others. A mechanism for the separation of the compound bands into individual bands is suggested.—*Masuo Kodani.*

13320. Mickey, George H. (*Louisiana State U., Baton Rouge.*) Endomitosis in tissues of the Louisiana lubber grasshopper, *Romalea microptera* (Beauv.). *Genetics* 32(1): 97. 1947.—An abstract.

13321. Novitski, E. (*California Inst. Tech., Pasadena.*) Chromosome variation in *Drosophila athabasca*. *Genetics* 31(5): 508-524. 2 maps, 8 fig. 1946.—A salivary gland chromosome investigation of *D. athabasca* taken from localities from Alaska to N. Carolina reveals that all the chromosomes have variable gene sequences. One, chromosome C, has a total of 17 sequences. Comparison of the phylogenetic relationships and geographical distribution of the sequences shows that they are of recent origin in terms of speciation. An analysis of the inversion breakage points suggests that certain inversions originate during the prophase of a cell heterozygous for an inversion.—*E. Novitski.*

13322. Pavan, C. (*Columbia U., N. Y. C.*) Chromosomal variation in *Drosophila nebulosa*. *Genetics* 31(6): 546-557. 11 fig. 1946.—The gene arrangement in the chromosomes of 8 strains of *D. nebulosa* from Texas, equatorial Brazil, and southern Brazil has been examined. The species has 3 pairs of chromosomes: a V-shaped X chromosome, a V-shaped and a rod-like autosome. In the salivary gland

cells 5 long euchromatic strands are found. The gene arrangement in the V-shaped autosome has been found to be constant. That in the X chromosome is constant, except for a single inversion found in some individuals of one strain from Texas. One of the points of breakage in this inversion lies in the chromocentral heterochromatin. The gene arrangement in the rod-like autosome (the 3d chromosome) is very variable. 17 gene arrangements in this chromosome have been identified; they arise through recombination of 8 separate inversions. Some groups of inversions are overlapping; this fact permits construction of the probable descent relationships of the different gene arrangements. Among the inversions, some are geographically widely distributed while others have been found in only a single strain.—*Auth. summ.*

13323. Sirtori, C., e G. Fiorani-Gallotta. (*U. Milan, Italy.*) Studio citologico su striscio dei tessuti normali e neoplastici. [Cytology of normal and neoplastic tissues.] *Tumori* 1941: 541-556. 1941.—The distinctive characters of malignant neoplastic cells, as contrasted with normal tissue cells, are: the larger size; polymorphism; blended cytoplasmic limits; remarkable increase in size of the nucleolus, and in the plasmatic index; characteristic spongy appearance of the nucleolus, which never has clear limits, and is sometimes rather notched; usually one or more thick nucleoli, eventual cytoplasmic metachromasy. Constant increase of the volume and altered nucleolus volume have been pointed out. This research is deemed especially important for tumors approachable from outside (of the lips, cheek, etc.).—*C. A. Lang.*

13324. Valadares, Maria. (*U. Lisbon, Portugal.*) On the structure of the salivary chromosomes. *Portugaliae Acta Biol. Ser. A* 1(3): 279-288. 1946.—Observations on acetic orcin smears of salivary nuclei of an unidentified sp. of *Drosophila* from Portugal. The polytene and alveolar structures are briefly discussed; the present observations favor the polytene theory. Threads connecting chromosomes are attributed to agglutination similar to that observed in root tips (stickiness).—*J. A. Serra.*

13325. Valadares, Maria, and Irene Regalheiro. (*U. Lisbon, Portugal.*) Olistherochromatin in *Drosophila*. *Portugaliae Acta Biol. Ser. A* 1(3): 271-277. 1946.—A note on the secondary constrictions (olistherozones) in the nuclei of salivary and other cells of larvae of an unidentified sp. of *Drosophila* from Portugal. In ganglion cells the nucleolar zones of the X and Y chromosomes show a variable chromomeric structure. In the salivary gland nuclei the nucleolus-forming region (nucleolar olistherozone) presents in this sp. a peculiar chromomeric structure with a 2-strand aspect; the authors claim that in the salivary gland nuclei the satellites are inside the nucleolus.—*J. A. Serra.*

13326. Valadares, Maria, and Irene Regalheiro. (*U. Lisbon, Portugal.*) "Difference in phase" in the euchromatic cycle of chromosomes of the same karyokinetic phase. *Portugaliae Acta Biol. Ser. A* 1(3): 312-315. 1946.—In an unidentified sp. of *Drosophilidae* collected in Portugal, mitotic chromosomes were found in all phases of condensation in the same and in different cells. The difference in the aspect of the chromosomes is apparently due to a "difference in phase" in the chromatic cycle.—*J. A. Serra.*

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 13269, 13279, 13283, 13284, 13289, 13290, 13291, 13297, 13298, 13299, 13301, 13308, 13316, 13317, 13318, 13322, 13438, 13443, 13445, 13455, 13465, 13696, 13917, 14014, 14279, 14286, 14341, 14470, 14473, 14480, 14486, 14507, 14517, 14528, 14533, 14556, 14631, 14632, 14633, 14637, 15142, 15238, 15240, 15242, 15245, 15256, 15258, 15267, 15360, 15383, 15413, 15415, 15426, 15435, 15443, 15554, 15566, 15592, 15699, 15776, 15853, 15854, 15988)

### GENERAL

13327. Hershey, A. D. (*Washington U., St. Louis, Mo.*) Mutation of bacteriophage with respect to type of plaque. *Genetics* 31(6): 620-640. 1946.—The bacteriophages T2, T4, and T16, all having antigenic and other properties in common, undergo an identical mutation from the lysis-inhibiting wild type ( $r^+$ ), to a non-lysis-inhibiting variant ( $r$ ), which is easily recognized by its larger and clearer plaque. The mutation occurs with a frequency of about one per thousand duplications of the virus in T2. In mixtures of

wild type and corresponding  $r$  mutant, propagated through serial cultures of susceptible bacteria, wild type gradually replaces  $r$ . Making use of this fact, it proves possible to demonstrate the reverse mutation from  $r$  to  $r^+$ , and the recovered lysis-inhibitor appears to be genetically identical with the original wild type. The back mutation is estimated to occur about once in  $10^8$  duplications of the virus. The  $r$  mutation does not alter host or antigenic specificity, nor are the characteristics of phage growth appreciably affected under conditions in which lysis-inhibition does not occur. This

genetic behavior suggests the idea of a discrete *r* locus in the phage particle, mutating independently of other loci. This idea is confirmed by the finding that a 2d mutation, one affecting host range, occurs at the same rate in wild type and *r* stocks of T2. A genetic notation descriptive of this behavior is suggested. Expts. in which bacteria are simultaneously infected with both wild type and *r* mutant of T2 give the unexpected result that in the majority of cells both phages multiply. The progeny are made up of the 2 types of phage in the same relative numbers with which the bacteria were infected, and add up to the same total yield that results from infection with either type alone. This provides an exception to the established principle of interference between related viruses. The paper includes discussions of methods of measuring rates of mutation, and of antigenic analysis by reciprocal absorption and neutralization tests.—*A. D. Hershey.*

13328. Hull, Fred H. (*Florida Agric. Expt. Sta., Gainesville.*) Theoretical regression of  $F_N$  on homozygous parents with additive or complementary gene action. *Genetics* 32(1): 91. 1947.—A mathematical formula is given to calculate regression coeffs.

13329. Wilczynski, J. Some new generalisations of genotypic formulae for Mendelian expectations. Über die allgemeine Gleichung der Mendel-Gesetze. [General equation of Mendel's laws.] Zum Teil ein Beitrag zur Deutung des Dominanzwesens. [A contribution to interpretation of the essentials of dominance.] *Biol. Gen. [Vienna]* 14: 47-54, 447-455. 1939.—The Mendelian expectations from crosses involving multiple pairs of alleles are presented in terms of binomial expansions. Dominance is regarded as a purely physiological phenomenon.

#### PLANT

13330. Boonstra, A. E. H. R. Physiologisch onderzoek en plantenveredeling. [Physiology and plant breeding.] *Landbouwk. Tijdschr.* 1942(666): 437-456. 9 fig. 1942.—Using beets as an example, the relation between plant breeding and the comparative physiology of crop vars.—earliness, drought resistance, hardiness and similar features, and the whole development, absorption, transpiration, organic nutrition and efficiency of different parts of the plant—can be demonstrated.—*I. Rietsema.*

13331. Dorst, J. C. Plantenveredeling. [Plant breeding.] *Landbouwk. Tijdschr.* 1942(666): 500-506. 1942.—A general survey of plant breeding from theoretical and practical points of view.—*I. Rietsema.*

13332. Fardy, A., et H. Hitier. (*Inst. Exptl. Tabacs, Bergerac, Dordogne, France.*) Espèces tétraploïdes et hybrides interspécifiques amphidiploïdes et triples diploïdes de *Nicotiana*, obtenus par l'action de la colchicine. [Colchicine-induced tetraploid species, interspecific amphidiploids and triple diploids among *Nicotiana*.] *Mém. Serv. Exploitation Indust. Tabacs et Allumettes* 1B(2): XXVII + 117. 11 pl. 1945.—A drop of an aqueous soln. containing 1% colchicine and 2% methylcellulose, deposited late in the evening on the terminal bud of *Nicotiana* seedlings, induces polyploidy in a large % of cases. In 16 spp. of *Nicotiana*, colchicine-induced tetraploidy was manifest at meiosis by such irregularities as tetravalent and polyvalent complexes, asynaptic monovalents or dividing monovalents; most pollen grains fail to develop and capsules contain about  $\frac{1}{10}$  the normal number of seeds. Seeds that germinate produce plants whose nuclei may show  $4n$ ,  $4n \pm 1$  or  $4n \pm 2$  chromosomes; roots are few and stumpy, leaves small and distorted. Crosses between different spp. of *Nicotiana* produced 14 hybrids, all of them sterile, but colchicine-induced amphidiploidy allows autosyndetic pairing of chromosomes, and yields stable progenies which behave as true species. Similarly, colchicine-induced diploidization makes it possible to obtain fertile diploid descendants from haploid triple hybrids, such as *glutinosa*  $\times$  *sylvestris*  $\times$  *tabacum* or *tabacum*  $\times$  *glutinosa*  $\times$  *glauca*.—*J. Dufrénoy.*

13333. Gerstel, D. U. (*U. California, Berkeley.*) Inheritance in *Nicotiana tabacum*. XXI. The mechanism of chromosome substitution. *Genetics* 31(4): 421-427. 1946.—Transfer of genes from one species to another is difficult where no or little conjugation between chromosomes takes place. One way of introducing foreign genes is to substitute entire chromosomes. The mosaic-resistant tobacco Holmes Samsoun had originated in this fashion. It carried the re-

sistance factor in a pair of chromosomes derived from *N. glutinosa* and substituted for a *tabacum* pair. Material for the present investigation was obtained by backcrossing the amphidiploid *N. tabacumglutinosa* to *tabacum* once or several times. In the resulting plants, with one or more single *glutinosa* chromosomes in addition to 2 full sets from *tabacum*, meiotic irregularities occurred such as non-conjunction of a *tabacum*-pair or trivalent formation between a *tabacum* pair and a *glutinosa* univalent. As a consequence a *glutinosa* chromosome could replace a *tabacum* chromosome at one of the poles. Some evidence indicates that these irregularities occur more often in the PMC's containing many *glutinosa* univalents than in those with only the univalent carrying the selected factor. A new case of substitution of the chromosome carrying the pink color factor of *N. glutinosa* for one of a white flowering tobacco is reported.—*D. U. Gerstel.*

13334. Haan, H. de. Klimaat en plantenveredeling. [Climate and plant breeding.] *Landbouwk. Tijdschr.* 1942(666): 483-499. 1942.—After having shown what has been attained in America and in Russia, the author points out what has to be aimed at in Holland in connection with hardiness, early ripening, length of day, drought resistance, resistance of cereals against layering and damage by rain in harvest time. Brief notes for breeders are given.—*I. Rietsema.*

13335. Haan, H. de. Soortkruising by planten. [Specific plant hybrids.] *Landbouwk. Tijdschr.* 1944(690): 384-399. 1944.—A survey of specific hybridization in various classes of plants.—*I. Rietsema.*

13336. Harland, Sydney Cross. The selection experiment in Peruvian Tanguis cotton. *Inst. Cotton Genetics Bull.* 1. 3-98. 1 fig. 1944.—Tanguis cotton arose from a single plant found in a field of Upland Suave in the Pisco Valley of Peru in 1908. Because of its resistance to Verticillium wilt, its slightly rough very white staple, its staple length of  $1\frac{3}{8}$ - $1\frac{1}{2}$  inches, high ginning percentage and high yield, it constituted 91% of the Peruvian crop by 1933, virtually replacing the formerly dominant Upland Suave. Tanguis is believed by the author to have originated from modified semi-aspero *Gossypium barbadense* plants which had been preserved as a minor component in Upland (*G. hirsutum*) fields for many generations. Although semi-aspero  $\times$  Upland crosses produce vigorous  $F_1$  hybrids, the  $F_2$  plants are weak and virtually sterile, so that the minor component of *barbadense* would be carried on in a state of extreme purity from selfed plants. The early maturity of Tanguis, more like Suave than semi-aspero cottons, is believed due to an accidental process of selection as a consequence of long association with Upland. Mechanical contamination of seedstock and natural crossing with the type it replaced had reduced the original Tanguis to an extremely mixed condition in the unselected commercial crop, and selection expts. were undertaken by the author to place improved seed at the disposal of planters. It was desired (1) to increase the yield, (2) to increase fiber length from a mean of  $1\frac{1}{4}$  to  $1\frac{3}{8}$  inches, (3) to produce a still whiter cotton, (4) to increase boll wt. and ginning percentage to the optimum, (5) to select for high Verticillium wilt resistance and resistance to aphids, (6) to maintain hair wt. per cm. at its current level, (7) to maintain a degree of heterogeneity which would permit future selection for characteristics not then necessary. Production of a pure line was considered to be of diminished importance to both consumer and grower, with regard to the commercial characteristics of Tanguis. Therefore, no self-fertilization was practiced and mixtures of strains rather than pure lines were grown. Initial material consisted of approx. 22,000 single-boll samples collected from fields in different localities. Original samples were examined for length and color and all below  $1\frac{1}{4}$  inch in staple length, or of bad color, were eliminated. The 1st season (1940-41) 2863 samples were retained and planted. The Egyptian method of sand sowing was used. Bolls with <22 seeds were discarded. When about  $\frac{1}{3}$  of the bolls were open, a bulk sample of 10 average bolls from each row was gathered and the lint examined for length, wt. per boll, color, fineness and general Tanguis character, and ginning percentage. All strains passing the bulk sample test were retained and each plant examined separately. All samples not conforming to a standard of  $1\frac{1}{4}$  inch length, 4.5 gm. boll wt., 39.5 ginning percentage, yield equal to or above arithmetic mean, typical Tanguis character, and good color, were discarded. The single plant tests were necessary to eliminate



some of the expected natural hybrids. Successive careful selection of the remaining 41 strains yielded 200 plants, the progeny of which were grown for the 2d season's expts. At the end of the 2d season (1941-42) the 200 selected strains were again tested for length, boll wt., ginning percentage, yield, color and fineness (as near as possible to grade 3). 43 strains were retained; the best 5 were propagated in a special plot and the other 38 strains mixed and released for multiplication on large haciendas. Results at the end of the 2d season showed that only 2 yrs. of rigid selection by the "mass pedigree norm system" obtained an improved mixture greatly superior in the 5 desired qualities but unchanged in the essential agric. properties of Tanguis. Further selection by similar methods gave strains for continued experimentation in 1942-43 and 1943-44. Of the 1941-42 selected strains, 63 proved satisfactory and were released for commercial multiplication under the name SNA 243 S. Behavior of the first wave of improved seed (SNA 242) under commercial conditions maintained the expected level of improvement over the ordinary Tanguis cotton.—*M. M. Young.*

13337. Hedayetulla, S., and S. Sen. (*Agric. Res. Sta., Dacca, India.*) Bud mutation in paddy. *Sci. and Culture* 12(1): 53-54. 1946.—In normal-appearing rice plants segregating from interbreeding an unstable dwarf type, bud mutations were noted in 2 plants. In one, some tillers bore stunted leaves, ears, and grains exactly like the dwarf ancestor; in the other, some tillers were without anthocyanin pigment in leaf sheath, stigma, and apicules.—*C. A. Reed.*

13338. Hollaender, Alexander (*Nation. Inst. Health, Bethesda, Md.*), and C. P. Swanson. (*Johns Hopkins U., Baltimore, Md.*) Modification of the x-ray induced mutation rate in fungi by pretreatment with near infrared. *Genetics* 32(1): 90. 1947.—An abstract. A significant increase in x-ray produced mutations in *Aspergillus terreus* and *Trichophyton mentagrophytes* was observed if the spores were previously irradiated with infrared radiation from 7,000 to 18,000 Å, with a maximum effect at 10,000 Å. The infrared alone did not produce mutation.

13339. Huskins, C. Leonard. (*U. Wisconsin, Madison.*) Fatuoid, speltoid and related mutations of oats and wheat. *Bot. Rev.* 12(8): 457-514. 1946.—After an historical introduction the author discusses: genetic studies of fatuoid, sterioid and subfatuoid oats, genetic studies on speltoid and compactoid wheats, cytogenetic studies of mutant wheat and oats, general conclusions. There is a bibliography of 215 citations.—*F. T. Addicott.*

13340. Kostoff, Dontcho. The problem of haploidy. (Cytogenetic studies on *Nicotiana* haploids and their bearings to some other cytogenetic problems.) *Bibliogr. Genetica [Gravenhage]* 13(1): 1-148. 40 fig. 1941.—The author studied haploids of *N. langsdorffii*, *N. sylvestris*, *N. rustica* and *N. triplex* [= *N. tabacum* × (*sylvestris* × *tomentosiformis*)] and also those derived from the amphidiploids *N. rustica-paniculata*, *N. sylvestris-tomentosiformis* and *N. glauca-langsdorffii*. The 2 first-mentioned originated by androgenesis, the others by parthenogenesis. They were obtained chiefly after cross-pollinations between different spp. or allopolyploids of *Nicotiana*. The literature on androgenesis is discussed and also that concerning the production of haploids in general. It is not certain whether cross-pollinations increase the frequency of haploids considerably above the spontaneous frequency. The origin of haploids under influence of temp. is not proved; x-rays, however, increase the frequency. Haploidy from twin embryos is discussed. Probably many "spontaneous" haploids as well as haploids from cross-pollinations originate from haplo-diploid twins. There is a high frequency of polyembryony and polyendospermy (15.1%) in the amphidiploid *Triticum timopheevi* × *monococcum*. The properties of haploids are described (smaller plant size; thin, narrow leaves; many small flowers; earlier start and longer duration of flowering period; smaller cells; sterility). Haploids derived from amphidiploids are similar to the original F<sub>1</sub>-hybrids, but differences are sometimes found. Data concerning the chromosome morphology of some *Nicotiana* spp. are given. The haploids have a tendency to somatic chromosome doublings. The haploids of *N. langsdorffii*, *sylvestris*, *rustica*, *triplex* and *sylvestris-tomentosiformis* have usually only univalents at meiosis, but occasional bivalents are also found. That of *N. rustica-paniculata* has usually 12 bivalents + 12 univalents, and

that from *N. glauca-langsdorffii* 5-9 bivalents + 11-3 univalents. Secondary association of the univalents was observed in haploid *N. sylvestris*. Progeny of the haploids contained "mutations" presumably resulting from crossing-over. The basic chromosome number is considered to be  $x = 6$  in *Nicotiana*. The behavior of univalents, the mechanism of pairing in haploids and the practical use of haploids are discussed.—*G. Östergren.*

13341. Kostoff, Dontcho. Wheat phylesis and wheat breeding from a cytogenetic point of view. (Cytogenetic indices for the rôle of interspecific hybridization in the origin of wheat species and for applying interspecific hybridization in producing valuable wheat forms.) *Bibliogr. Genetica [Gravenhage]* 13(2): 149-224. 4 fig. 1941.—A review of the cytogenetics of *Triticum* and related genera with special regard to the possibilities of plant breeding by interspecific hybridization. The most important results obtainable by such hybridization are the transference of valuable characters from one species to another. The ease of this depends on the degree of crossing-over between homologous or partially homologous chromosomes from the different spp., i.e., the allosyndesis, a factor also giving important phylogenetic information. Consequently studies of chromosome pairing and other cytogenetic and phylogenetic studies are of great importance in predicting the success of such plant breeding plans. The chromosome pairings in interspecific and intergeneric hybrids of *Triticum*, *Secale*, *Aegilops*, *Haynaldia* and *Agropyrum* are tabulated and extensively discussed with regard to their theoretical and practical significance. The importance of triple and multiple hybridization is pointed out. For this purpose, e.g., an amphidiploid of 2 spp. can be crossed with a 3d.—*G. Östergren.*

13342. Lowe, Jeannette, and Oliver E. Nelson, Jr. (*Agric. Expt. Sta., New Haven, Conn.*) Miniature seed. A study in the development of a defective caryopsis in maize. *Genetics* 31(5): 525-533. 2 pl., 1 fig. 1946.—Miniature, a new defective seed character in maize, is unique in that it combines an 80% defectiveness in seed wt. with normal growth in both the gametophytic and sporophytic generations. Embryo and endosperm, though much reduced in size, are proportionally the same as in normal kernels, and an aleurone layer and the same type of starch as in normal, are present. The defective condition is controlled by a single gene, locus unknown, which is recessive to normal, but epistatic to sugary and brittle. Histological study of both normal and miniature caryopses at stated intervals following pollination reveal that the miniature factor in some way allows dissolution of the chalazal layer, starting at the 9th day after pollination. The resulting gap in nutrient supply between ovary and endosperm prevents further growth of the caryopsis, although development continues. In the normal seed the chalazal bridge is intact at all stages, thus insuring an adequate nutrient flow for continued growth and development of the seed.—*Jeannette Lowe.*

13343. Mol, W. E. de. Na het vyftiende jaar röntgenbestraling van tulpen ter verkryging van knopmutaties. [After the fifteenth year of X-ray treatment of tulips for promoting mutations.] *Landbouwk. Tijdschr.* 1944(687): 173-190. 1 col. pl., 9 fig. 1944.—Tulip bulbs have been treated with 100-200 r, and observed since. Several mutations were thus obtained. The observations of 1943 are described in detail, involving 16 vars., some of them treated as early as 1928. Most of the earlier mutations proved to be constant, though reversion to the old types has been found. Some mutations as the result of treatment in 1940 appeared in 1943. A classification of all the mutations since 1928 mentions 98 cases, 32 of which had only a paler color than the original vars., including 3 pure whites; 18 were darker, 5 mutating from violet to pink, 4 from pink to violet, 5 producing yellow plastids, one yellow var. producing anthocyan, 12 mutating their leaf color and 20 showing differently shaped flowers or combining different shape and color mutation. Since 1928, 5 of the treated vars. have shown mosaic-like symptoms but it could not be detd. whether this is really a virus disease.—*I. Rietsma.*

13344. Robb, W. Notes on plant breeding in Sweden. *Scottish Agric.* 26(3): 151-157. 2 fig. 1947.—Describes the work of the plant breeding Stations at Svålof, Landskrona, and Uppsala, which covers all cereals, roots, potatoes, flax, clovers and grasses, etc. Attention is paid to disease

resistance, improved yields, hardiness, quality, while lists are given of promising new vars. recently bred in Sweden. Administration, financing and co-ordination with commercial interests is explained, while full details are given of seed testing and certification schemes.—C. E. Foister.

13345. Shiffriss, Oved. (*W. Atlee Burpee Co., Doylestown, Pa.*) On developmental reversal of "dominance". *Genetics* 32(1): 103. 1947.—An abstract. Data based on individual plant history and taken at frequent intervals during the growing season, in large  $F_1$ ,  $F_2$ ,  $F_3$  and backcross populations of a cross between a green-fruited vine and yellow-fruited "bush" strain in *Cucurbita pepo*, show that heterozygotes manifest the characteristics of one parent early in the growing season and those of the other parent later on. Heterozygotes seem to differ from each other in the stage at which the turning point occurs as well as its duration, depending on allelic combination.

13346. Stadler, L. J. (*U. Missouri, Columbia.*) Spontaneous mutation at the R locus in maize. I. The aleurone-color and plant-color effects. *Genetics* 31(4): 377-394. 1946.—The gene  $R^+$  (colored aleurone, colored plant) mutates spontaneously with appreciable frequency to 2 distinct forms,  $r^+$  (colorless aleurone, colored plant) and  $R^0$  (colored aleurone, colorless plant). In 2 sib-plants of  $R^+$ :Columbia, tested extensively for frequency of R mutations among the  $\sigma$  gametes, the frequencies of mutation to  $r^+$  and to  $R^0$  were of the same order ( $10^{-3}$ – $10^{-4}$ ). No mutations to intermediate levels of plant-color effect were found, although the technic was such as to detect mutation to various known intermediate levels. The spontaneous mutations to  $r^+$  and to  $R^0$  have no appreciable effect upon viability or physiological efficiency in haplophase, as judged by competitive pollen-tube growth in pollinations from heterozygous plants. The homozygous mutants are wholly normal in viability and development. Spontaneous mutations to  $r^0$ , involving simultaneous loss of aleurone-color and plant-color effect, were very rare, but not so rare as would be expected if due only to chance coincidence of independent mutations for aleurone-color and plant-color. The 2 spontaneous mutations to  $r^0$  observed were also without appreciable effect upon viability and physiol. efficiency. Aleurone-color mutation has no appreciable effect upon the level of plant-color expression, and plant-color mutation no effect upon the level of aleurone-color expression. In the former case very slight difference in level of gene action could be detected if present. Plant-color mutation has a pronounced effect upon aleurone-color mutability of the gene or gene-complex concerned. This is shown by the much-lowered aleurone-color mutability of the mutant  $R^0$  allele, as compared with the parent  $R^+$  allele. This result is not consistent with the assumption that the  $r^+$  and  $R^0$  mutations represent independent alterations of distinct components of the gene or gene-complex  $R^+$ .—L. J. Stadler.

13347. Thomas, I., and A. J. Millington. Recent developments in Australian wheat-breeding. *Jour. Dept. Agric. Western Australia* 22: 277-293. 1945.—Wheat breeding work is briefly reviewed with reference to flour strength and disease resistance. A useful catalogue gives particulars of the vars. registered since 1927.—*Courtesy Pl. Breeding Absts.*

13348. Wellensiek, S. J. Vegetatieve vermeerdering en plantenveredeling, speciaal by rogge. [Vegetative reproduction and plant breeding, especially in connection with rye.] *Landbouwk. Tijdschr.* 1942(666): 422-436. 4 fig. 1942.—Vegetative reproduction can be used for keeping alive certain genotypes of cross pollinators from one year into the next, and sometimes for several years in succession, and also for obtaining large numbers of individuals of one genotype. Division of rye is easy. It can be done after sowing about the end of April. In one season 130 clones have been obtained, averaging 100 individuals. These clones are used for investigation, crossing, seed production and selection.—I. Rietsema.

13349. Anonymous. Progress of technical schemes. Agricultural research. *Bull. Indian Centr. Jute Comm.* 12: 640-641. 1946.—At Dacca, bitterness in *Corchorus capsularis* has been found to be conditioned by a single gene, which is linked with the factor *Br* for branching, with a cross-over of 30.5%. No evidence of linkage between the gene for bitterness and the A Allelomorph series for pigmentation has been obtained.—*Courtesy Pl. Breeding Absts.*

# ANIMAL (EXCEPT MAN)

13350. Blanc, Richard. (*U. Rochester, N. Y.*) Dominant genes of the vestigial series in *Drosophila melanogaster*. *Genetics* 31(4): 395-420. 3 fig. 1946.—The problem of genetic modification of dominance in *D. melanogaster* is attacked through studies of the effect of modifiers on the expression of vestigial in heterozygous condition. A similar study is made of the effect on two alleles of vestigial,  $vg^{nw}$  and  $vg^{No. 2}$ , and on a number of deficiencies involving the vestigial locus. Use is made of a number of "isochromosomal" stocks, constructed to differ from each other as regards a particular chromosome or chromosomes. The presence of dominance modifiers is demonstrated for most of the chromosomes tested. The modifiers in combination produce effects greater than expected from a summation of their individual potencies, a circumstance which suggests that the modifiers considered act on the same or closely related developmental processes. Most of the gene modifiers have no visible effect other than their influence on the dominance of vestigial, but it seems highly probable that 3 "visible" mutants—*pr*, *ss*, and *b*—also act as modifiers of dominance for vestigial. The possibility of grouping of "invisible" modifiers about the locus of vestigial is considered with particular reference to the bearing of such a situation on the nature of allelism. The dual action of the "visible" modifiers suggests that many examples of pleiotropism may fall into a special case of the action of gene modifiers. Mather's distinction between polygenes and oligogenes is considered as not justified on the basis of the present work. A hypothesis of alteration in time relationships of developmental processes is advanced as an explanation of the action of dominance modifiers.—Richard Blanc.

13351. Caspari, Ernst. (*U. Rochester, N. Y.*) On the effects of the gene *a* on the chemical composition of *Ephestia kuehniella* Zeller. *Genetics* 31(5): 454-474. 1946.—In *aa* *Ephestia* the formation of kynurenin is inhibited. The tryptophane content in *aa* larvae and adults is increased as compared to the wild type. The excess of tryptophane is found in the protein fraction. The total amt. of proteins is not increased. It is concluded that in *aa* animals the oxidation of tryptophane to kynurenin is inhibited either by direct inhibition of the oxidation process or because of lack of availability of tryptophane. *v. Drosophila* does not show any increase in tryptophane content, suggesting that the gene *v* is not homologous to *a* in *Ephestia*. In *aa* animals the ether-extractable materials are reduced in amt. as compared to wild type. It is concluded that as a result of the gene substitution  $a^+ \rightarrow a$  the biochemical setup of the cell is altered.—Auth. summ.

13352. Chapman, Arthur B. (*U. Wisconsin, Madison.*) Genetic and nongenetic sources of variation in the weight response of the immature rat ovary to a gonadotrophic hormone. *Genetics* 31(5): 494-507. 1946.—The relative importance of the genetic and nongenetic sources of variation in the wt. response of the immature rat ovary to a standard dose of gonadotrophin in a colony of random-bred animals maintained under relatively uniform conditions for  $2\frac{1}{2}$  yrs. are approx. as follows: uncontrolled monthly fluctuations, 17%; intra-month post-mortem body wt., 13%; intra-month, intra-body-wt.—heredity, 28%, maternal factors, 6%, nonmaternal nongenetic factors common to litter mates, 9%, and environmental factors not common to litter mates, 27%. Application of these results to design of expts. and selection procedures is discussed.—A. B. Chapman.

13353. Dickie, M. M., and G. W. Woolley. (*R. B. Jackson Mem. Lab., Bar Harbor, Me.*) The age factor in weight of yellow mice. *Jour. Heredity* 37(12): 365-368. 3 fig. 1946.—Weights were recorded on 161 mice of the  $F_1$  generation of a strain JAX yellow  $\sigma \times$  strain JAX  $ce \sigma$  cross. They were divided as follows: 33 yellow  $\sigma$ , 39 yellow  $\sigma$ , 47 non-yellow  $\sigma$ , and 42 non-yellow  $\sigma$ . These wts., when tabulated at monthly intervals, showed that yellow  $\sigma$  were the heaviest of the 4 groups followed by yellow  $\sigma$ , non-yellow  $\sigma$ , and non-yellow  $\sigma$ . Peak wts. were recorded between 7 and 18 months of age and after 18 months of age the yellows, both  $\sigma$  and  $\sigma$ , decreased in wt. so that by 24 months of age they were approx. the same wt. as non-yellow littermates. Some thin yellow mice were found; the genetic problem created by their occurrence is discussed.—Auth. abst.

13354. Dubinin, N. P., and G. G. Tiniakov. (*Acad. Sci., USSR., Moscow.*) Inversion gradients and natural selection in ecological races of *Drosophila funebris*. *Genetics* 31(6): 537-545. 1946.—In early June 1945, a total of about 100,000 *D. funebris* flies homozygous for a certain inversion were liberated at the Biol. Station near Kropotova, 115 km. s.-w. of Moscow. In July, the descendants of the released flies were present in the populations of localities about 1 km. distant from the point of release. The relative frequencies of the inversion homozygotes and heterozygotes was found to be approx. that expected on the basis of the Hardy equilibrium formula, with the heterozygotes somewhat more frequent. It is estimated that the rate of diffusion of *D. funebris* during the early part of the summer amounts to about 50-100 meters per day on the average. Natural selection favors the inversion heterozygotes more than it does the Standard homozygotes, and the latter more than the inversion homozygotes. We are dealing here with a case of intrapopulational heterosis. This phenomenon is very important in the dynamics of natural populations. The action of natural selection, however, is far more complex than the data on the intrapopulational heterosis would by themselves suggest. Thus, during hibernation both inversion homozygotes and heterozygotes are discriminated against in favor of the Standard homozygotes. The action of natural selection is also different in rural and in urban populations.—*Auth. summ.*

13355. Fletcher, J. Lane. (*Mississippi State Coll., Starkville.*) A study of the first fifty years of Tennessee Walking Horse breeding. *Jour. Heredity* 37(12): 369-373. 3 fig. 1946.—The breeding of the Tennessee Walking Horse was studied by the use of 5 samples derived from the breed stud book. The average inbreeding for the groups ranged from 1.24% for the foundation animals to 3.62% for those born in 1940. The average inter se relationships ranged from 2.96% for the foundation animals to 6.45% for those born in 1935. The inter se relationship of the 1940 group was 5.8%. The 2 outstanding individuals of the breed were Allan F-1 and Roan Allen F-38. Their relationships to the 1940 group were 16.48% and 19.44%, respectively. The influence of the Standardbred and American Saddle Horse was shown by the relationship of the groups to each breed. The 1940 group had increased in relationship to the Standardbred and declined in relationship to the American Saddle horse. The average interval between generations was 10.02 yrs.—*Auth. summ.*

13356. Gordon, Myron. (*New York Aquarium, N. Y. C.*) Genetics of *Platypoecilus maculatus*. IV. The sex determining mechanism in two wild populations of the Mexican platyfish. *Genetics* 32(1): 8-17. 2 fig. 1947.—The sex-determining mechanism in 2 wild populations of the Mexican platyfish (*P. maculatus*), one from the Rio Papaloapan and the other from the Rio Jamapa, both in the State of Veracruz, may be expressed as follows: ♀♀ = XX, ♂♂ = XY. This is in direct contrast with the genetic method of sex determination in domesticated breeds of the same species in which ♀♀ = WZ, ♂♂ = ZZ. It is suggested, in view of the probable origin of the WZ-ZZ system from the XX-XY by means of introgressive hybridization of *P. maculatus* with *Xiphophorus hellerii*, that the X and Z are homologous. The domesticated platyfish formula should now read ♀♀ = WY, ♂♂ = YY. An instance of sexual transformation of a genetically constituted ♀ of the "wild" stock with the formula of XX was reported. When this XX ♂ was mated with a normal "wild" ♀, also XX, all their offspring, 153, were ♀♀, XX. The details of the effect of introgressive hybridization on the mechanics of sex determination are suggested. *P. variatus* and *P. xiphidium* have the same sex determining mechanism as the wild *P. maculatus*. The mechanism in the swordtail, *X. hellerii*, has not yet been detd.—*Myron Gordon.*

13357. Gordon, Myron. (*New York Aquarium, N. Y. C.*) The three to one ratio in genetic sex determinations. *Genetics* 32(1): 88-89. 1947.—An abstract. In *Platypoecilus maculatus*, the genetic sex-determining mechanism is different in "domestic" and "wild" stocks. Some spotted ♀♀, (W)Sp/(X)+, when mated with "wild" striped ♂♂, (X)+/(Y)Sr, produced 3 times as many daughters as sons.

13358. Gordon, Myron. (*New York Aquarium, N. Y. C.*) Genetics of ocular-tumor development in fishes (preliminary

report). *Jour. Nation. Cancer Inst.* 7(2): 87-92. 3 fig. 1946.—Most of the instances of ocular tumors in fishes under observation of the writer were albinos or had albino parents or grandparents. The gene for albinism *i* is not the primary factor for ocular-tumor development, but another recessive factor *oc* appears to be. Ocular tumors were observed also in fishes in which albinism was not involved. This fact suggests that in producing the exophthalmic melanoma, the ocular gene *oc* in some stocks may be associated with the *i* gene for albinism, whereas in other stocks this association may not exist.—*Auth. summ.*

13359. Hays, F. A. (*Massachusetts Agric. Expt. Sta., Amherst.*) Methods of selecting breeding stock in high fecundity expts. *Genetics* 32(1): 90. 1947.—An abstract. Expts. on 1705 Rhode Island Reds indicate that in a flock where age at sexual maturity, absence of broodiness and high persistency are genetically stable, gross egg production is a reasonably satisfactory criterion of transmitting ability.

13360. Heisdorf, Arthur J., N. R. Brewer, and W. F. Lamoreux. (*Kimber Poultry Breed. Farm, Niles, Calif.*) The genetic relationship between mortality from induced and spontaneous lymphomatosis. *Poultry Sci.* 26(1): 67-73. 1947.—Subcutaneous inoculation with lymphomatous tissue failed to differentiate between a line of White Leghorns selected for resistance to neoplasms, and one selected for susceptibility. In the resistant line there was no significant relationship between the losses from lymphomatosis among birds which had been inoculated subcut. with lymphomatous tissue, and the losses suffered by their full or half-sibs which were raised as controls under natural exposure. Placing lymphomatous tissue in the crops, eyes, and nostrils of baby chicks from the resistant and susceptible lines, resulted in a highly significant difference ( $\chi^2 = 34.4$ ) between the losses from lymphomatosis in the two lines. There was a significant correlation ( $r = 0.18$ ) between the losses from lymphomatosis among 159 families of birds in the resistant line which had received oral doses of lymphomatous tissue, and the losses suffered by their full-sibs raised under natural exposure.—*W. F. Lamoreux.*

13361. Hollander, W. F. (*Larson Junior Coll., New Haven, Conn.*) Demonstration of pigeon genetics. *Genetics* 32(1): 90. 1947.—An abstract. The present status of genetics in domestic pigeons is demonstrated by means of specimens, charts, and literature.

13362. Hutt, F. B., and Helen Bozovich. (*Cornell U., Ithaca, N. Y.*) On the supposed matroclinous inheritance of egg size in the fowl. *Poultry Sci.* 25(6): 554-561. 1946.—The view of Waters that the sire does not influence the size of eggs laid by his daughters was examined. Analyses were made of 19 diallel matings in each of which at least 6 dams had wts. recorded for daughters by 2 sires. In the case used to illustrate the method of analysis, the 2d sire lowered by ams. ranging from 1.4 to 8.1 gm. the egg wt. of daughters from 9 of the 10 dams to which he was mated. The mean egg wt. for his 46 daughters was 3.6 gm. less than that for the 41 daughters of the other sire. Similar statistically significant differences between the paired sires in mean egg wt. of daughters were found in 8 of the 19 pairs. Analyses of variance applied to egg wts. for the offspring of 13 ♂♂ in one year and of 17 different ♂♂ in another yr. showed that in each case there were significant differences among sires in the egg wt. of their daughters. The fallacies underlying Waters' contention are discussed. It is pointed out that while one sire may not influence the egg size of his offspring by one dam any more than does that dam herself, his progeny usually number 10-15 times those of any one dam in his breeding pen. Consequently, the proverb that "the sire is more than half the flock" applies to egg size as well as to any other quantitative character.—*F. B. Hutt.*

13363. Irwin, M. R. (*U. Wisconsin, Madison.*) A comparison of the antigenic characters which distinguish Pearl-neck and Senegal, respectively, from Ring dove. *Genetics* 32(1): 92. 1947.—An abstract. At least 9 antigenic compounds of the red blood cells which differentiate Pearl-neck (*Streptopelia chinensis*) from Ring dove (*S. risoria*) have been obtained as units, following successive backcrosses. At least 10 antigenic substances to distinguish Senegal (*S. senegalensis*) have been identified as single entities.

13364. Landauer, Walter. (*Storrs Agric. Expt. Sta.,*



Storrs, Conn.) Insulin-induced phenocopies and their bearing on the causes of pleiotropism and on the problem of genetic modifiers. *Genetics* 32(1): 94. 1947.—An abstract. Embryos or chicks in which rumpleness has been induced by injn. of insulin into the eggs prior to incubation or during the first 2 days of development may be considered phenocopies of hereditary rumpleness. After the 3d day, rumpleness can no longer be produced by the injn., but a syndrome resembling the "short upper beak" lethal mutation appears.

13365. Mampell, Klaus. (*California Inst. Tech., Pasadena.*) Genic and nongenic transmission of mutator activity. *Genetics* 31(6): 589-597. 1946.—The genetic information concerning the mutator gene in *Drosophila persimilis* has been extended. Females are unable to induce primary or secondary mutations, because they do not produce the mutator substance. When they are given a Y chromosome, they can make and transmit the mutator substance, thus inducing primary and secondary mutations. Primary mutation is evidently increased in the ♂ by a 2d Y chromosome. Quantitative and qualitative variations in the mutability can be shown to be due to differential susceptibility of the genes to the mutator. When the mutator is in cytoplasm (from the ♀) which has previously been influenced by the mutator substance, its effectiveness may be increased. The mutations are genetic deficiencies, conceivably representing heterochromatin inactivations of genes rather than physical deficiencies. High mutability of the same appearance as in the mutator strain has been observed in other strains; there, it is not due to the mutator gene. The possibility of transmission of the mutability by infection was tested. Pairs of *melanogaster* were placed in cultures with adult *pseudodobscura* flies. Mutability is increased in the descendants of *melanogaster* raised in cultures with mutator or wild type ♂♂; it is not increased in cultures with mutator or wild type ♀♀. The mutability in infected strains tends thereafter to persist. A hypothesis as to the nature and mode of action of the mutator particles and the mutator-plus particles is presented. It has been argued that perhaps the normal symbiotic particles of one species may become parasitic virus particles when transferred to another species.—Klaus Mampell.

13366. Mead, S. W., P. W. Gregory, and W. M. Regan. (*U. California, Davis.*) Deleterious recessive genes in dairy bulls selected at random. *Genetics* 31(6): 574-588. 1946.—Six sires, 5 Jersey and 1 Holstein, were selected at random so far as recessive genes were concerned and were tested for recessives by sire-daughter matings and other mating tests. Two lethal genes were found—one conditioning imperfect epithelium, the other an achondroplasia-like anomaly. The nonlethal genes were those conditioning proportionate dwarfism, flexed pasterns, strabismus, and congenital cataract. Two different forms of ♀ sterility that prevented heifers from conceiving or producing offspring were also encountered. Both forms of sterility are sex-limited. There was no evidence that the fertility of heterozygous cows is impaired. One Jersey bull that was fully fertile was assumed to be homozygous for the Jersey type of ♀ sterility. None of the sires proved was homozygous for the Holstein type of ♀ sterility; but it is assumed that homozygous sires are fertile. The expected proportions of sterility in heifers based upon the gene frequencies found are compared with the actual figures recorded in the literature. The matings provided some data concerning the linkage relations of certain combinations of the mutant genes. The matings involving the combination of achondroplasia, strabismus, and flexed pasterns indicated that these genes are independent. Other matings indicated that cataract and the ♀ sterility found in Jerseys are independent. The feasibility of an organized program for amassing all kinds of genetic data on domestic animals is discussed.—Authors.

13367. Muller, H. J. (*Indiana U., Bloomington.*) A comparison of the potentialities of individual loci for different types of visible mutations. *Genetics* 32(1): 98-99. 1947.—An abstract. Examination was made of about 50,000 *Drosophila* ♀♀ receiving a maternal X chromosome with six markers (*y pn w v g f*) simultaneously present and a paternal X with these genes originally normal, irradiated with 5000 r in the spermatozoon stage. The frequencies of apparent gene mutations differed strikingly (garnet most frequent). Probable minute deletions occurred in rather similar frequencies in all but yellow (close to "viability gene").

Effects associated with gross rearrangements differed greatly in frequency. Thus far no significant differences have appeared in frequency of small deletions, relative to gene mutations from radium as compared with X-ray contrary to expectation under the "sensitive volume" hypothesis.

13368. Spencer, Warren P. (*Coll. Wooster, Ohio.*) High mutant gene frequencies in a population of *Drosophila immigrans*. *Ohio Jour. Sci.* 46(3): 143-151. 1946.—A population sample of *D. immigrans* was collected from 3 traps in a woodland lot in a western Pennsylvania village in Sept., 1944. 55 P<sub>1</sub> pair matings of wild flies, followed by 7 F<sub>1</sub> pair matings of each of these resulted in the recovery in the F<sub>2</sub> of 14 visible mutants. The bristle gene, "stubble", on the basis of the number of times recovered, is estimated to have had a frequency of about 10% in the gene population sample, and the eye-color gene, "brick", a frequency of about 4%. Counting recurrences, the 110 flies analyzed carried in all about 47 visible mutant genes in heterozygous form. Extreme winter reduction in population size, resulting in chance fluctuation of gene frequencies, is considered the probable explanation of the high incidence of "stubble" and "brick".—W. P. Spencer.

13369. Stern, Curt, E. H. MacKnight, and M. Kodani. (*U. Rochester, N. Y.*) The phenotypes of homozygotes and hemizygotes of position alleles and of heterozygotes between alleles in normal and translocated positions. *Genetics* 31(6): 598-619. 1946.—Out of 19 position alleles, *R*(+), in which a chromosomal rearrangement had taken place close to the locus of the + allele of the recessive mutant gene cubitus interruptus (*ci*) of *Drosophila melanogaster*, 4 *R*(+) alleles showed the following peculiarity: Both ♀ and ♂ heterozygotes *R*(+)/*ci* exhibit a more extreme degree of interruption of wing veins than the homozygote *ci/ci*. Hemizygotes of the constitution *R*(+)/*M*<sub>4</sub> for all 4 *R*(+) alleles, designated as *R*<sup>2</sup>(+), *R*<sup>3</sup>(+), *R*<sup>12</sup>(+), and *R*<sup>15</sup>(+), are normal in phenotype, with probably a slightly greater tendency for weak degree of *ci* venation than in +/*M*<sub>4</sub>. Homozygotes for *R*<sup>2</sup>(+) and *R*<sup>15</sup>(+) are not viable. *R*<sup>12</sup>(+)/*R*<sup>12</sup>(+) appear normal, *R*<sup>2</sup>(+)/*R*<sup>2</sup>(+) similar to *ci/ci*. The heterozygotes *R*(+)/*ci* for all 4 *R*(+) alleles are more extreme than the *R*(+) hemizygotes and the *ci* homozygotes. The heterozygotes between *R*<sup>2</sup>(+) or *R*<sup>12</sup>(+) and *ci* are more extreme than either of the 2 homozygotes. Triploenic heterozygotes of the types *R*<sup>2</sup>(+)/*ci/ci* and *R*<sup>15</sup>(+)/*ci/ci* were obtained. They are intermediate in phenotype between the 2 diploenic heterozygotes. Cytologically the rearrangements *R*<sup>2</sup>(+) and *R*<sup>12</sup>(+) involve a break in the right arm of chromosome 4 between the *ci* locus and the kinetochore. *R*<sup>3</sup>(+) involves a break in the left arm of chromosome 4. *R*<sup>15</sup>(+) consists of an insertion of a section of chromosome 4, right arm including the *ci* locus into chromosome 2. The properties of the *R*(+) combinations cannot be accounted for satisfactorily (a) by assigning combining powers, *c*, and efficiencies, *e*, to the position alleles different from the *c* and *e* attributes of the normally located + allele, nor (b) by assuming a complex relation between varying quantities of gene product and phenotype. A hypothesis is developed according to which the attributes of position alleles remain unchanged whereas the amount of substrate, *S*, available to a position allele is reduced as compared to that present in the original position. This hypothesis demands the specification that in heterozygotes the normally located allele has an at least partial priority on *S*, with the position allele sharing *S* to a secondary degree. Altogether, a position effect is regarded as dependent upon (1) the changed position of the gene whose effect is studied, (2) the specific allele of the gene concerned, and (3) the type of translocated material which has taken the original place of the position allele. The proposed hypothesis does not require somatic pairing in heterozygotes involving position alleles.—Auth. summ.

13370. Strong, L. C. (*Yale U. Sch. Med., New Haven, Conn.*) The induction of germinal mutations by chemical means (methylcholanthrene). *Genetics* 32(1): 108-109. 1947.—An abstract. Subcut. injn. of methylcholanthrene (both parents injd. at 60 days of age for 18 generations) resulted in 50 germinal mutations involving coat color, or a rate of 1 in 500 mice, as contrasted with a rate of 1 in 26,250 mice for untreated animals. Other embryological disturbances are discussed, as well as alterations in susceptibility to induced tumors.

13371. Tan, C. C. (Columbia U., N. Y. C.) *Genetics of sexual isolation between Drosophila pseudoobscura and Drosophila persimilis*. *Genetics* 31(6): 558-573. 1946.—Sexual preference tests were made using different mutant strains of *D. pseudoobscura*—namely, orange purple (*or pr*), orange (*or*), white (*w*), aristapedia (*ast*), Bare Curly (*Ba Cy*), yellow singed vermillion compressed short (*y sn v co sh*), and one wild type strain. The *y sn v co sh* ♂♂ inseminated more ♀♀ of their own kind than ♀♀ of other mutant strains or of wild type. This effect depends upon the mutant yellow. Other tests showing preferential matings indicated that (1) wild type ♂♂ inseminate more or than wild type ♀♀, (2) *or pr* ♂♂ inseminate more or *pr* than wild type ♀♀, (3) *ast* ♂♂ inseminate more *Ba Cy* than *ast* ♀♀, (4) *Ba Cy* ♂♂ inseminate more *Ba Cy* than *ast* ♀♀ and (5) *or* ♂♂ inseminate more or than *ast* ♀♀.—Hybrids of *D. pseudoobscura* and *D. persimilis* were obtained ranging in chromosomal constitution from individuals having all chromosomes of *D. pseudoobscura* to individuals having equal numbers of *D. pseudoobscura* and *persimilis* chromosomes. When representatives of the different classes of backcross hybrid ♀♀ were placed together with *D. pseudoobscura* ♀♀ and *D. pseudoobscura* ♂♂, slightly more hybrid than *D. pseudoobscura* ♀♀ were inseminated.—When a mixture of backcross hybrid ♀♀ and *persimilis* ♀♀ is exposed to *persimilis* ♂♂, the results also show a slight preference for mating with the hybrids; but those classes of hybrid ♀♀ which do not carry the X chromosome, or the 2d chromosome, of *persimilis* are preferred by *persimilis* ♂♂ to a smaller extent than those ♀♀ which carry these chromosomes.—When *persimilis* ♂♂ are placed with *pseudoobscura* ♀♀ and with backcross hybrid ♀♀, the results show a significant preference for mating with the hybrids, with the exception of the 4 classes of hybrids which do not carry either an X chromosome or a 2d chromosome of *persimilis*. This suggests that the main factors which distinguish the mating behavior of *persimilis* from *pseudoobscura* lie in the X and 2d chromosomes.—*Auh. summ.*

13372. Taylor, Lewis W. (U. California, Berkeley.) *Multiplex combs*. *Poultry Sci.* 25(6): 610-615. 1 fig. 1946.—Development of a true-breeding strain of chickens having multiplex combs, fundamentally a modification of single combs, is described and illustrated. The strain is not yet homozygous for all of the genes involved in the production of multiplex types of combs. Multiple factors, some with complementary action and apparently identical with genes producing sidesprigs, are involved in the production of multiplex combs. Multiplex combs are genetically distinct from pea combs.—*L. W. Taylor.*

13374. Villee, Claude A. (Harvard U. Med. Sch., Boston, Mass.) *Phenogenetic studies of the homoeotic mutants of Drosophila melanogaster*. IV. Homoeotic and "growth rate" genes. *Genetics* 31(4): 428-437. 1946.—Isogenic stocks of the growth rate genes *dachs*, *dachsous*, 4-jointed, and *combgap*, and the homoeotic genes *proboscipedia*, *aristapedia*, *aristapedia-Bridges*, and *bithorax* were set up, all possible combinations of growth rate and homoeotic genes were made, and the phenotypes of the combinations noted. *Aristapedia* and *aristapedia-Bridges* decrease the number of segments per tarsus and the length of the individual tarsal segments when combined with *d*, *ds*, *ff*, or *cg*. *Bithorax* decreases the number of segments per tarsus in combination with *d* and *ff* but not in combination with *ds* and *cg*. *Dachs* has the same effect on the phenotypes of the homoeotic mutants as exposing the larvae of homoeotic flies to low temp. Four-jointed, *dachsous*, and *combgap* have an effect similar to that of exposing the larvae to high temp. Thus, despite similar phenotypes and apparently similar modes of development, the genes *d* and *ff* have opposite effects on the development of the homoeotic genes. An explanation of the data in terms of Goldschmidt's theory of the action of homoeotic genes is given. The lack of interactions between *proboscipedia* and the growth rate genes may be due to a later time of maturation of the labial buds. The observations corroborate and extend Waddington's findings that *dachs* causes a lessening and *combgap* an increase in the rate of development during the larval period.—*C. A. Villee.*

13375. Villee, Claude A. (Harvard Med. Sch., Boston, Mass.) *A quantitative study of phenocopy production with monochromatic ultraviolet irradiation*. *Biol. Bull.* 92(1):

1-9. 1947.—*Drosophila* larvae, prepupae and pupae of various ages and genotypes were irradiated with u.-v. of 2537 Å and in dosages varying from 330 to 79,200 ergs/mm<sup>2</sup>. The phenocopies produced varied with the age of the irradiated fly, the stock used and the total dosage. Irradiation with u.-v. does not cause a retardation of pupation as X-radiation does. Larvae show a gradual increase in u.-v. sensitivity with age from 50 to 100 hrs. after hatching to a maximum of 1 hr. after pupation, then a sharp decrease with pupa age. There are 2 periods in the larval stage, at 50 and 100 hrs. after hatching, of greater phenocopy production for a given amt. of radiation. Irradiation during the first 24 hrs. of pupal life produces fewer phenocopies per energy unit than during the larval period. The sensitive periods for the production of certain phenocopies by u.-v. are compared with those for X-radiation and temp. treatments. Some are identical, a few are different. Irradiations of the same total dosage produce the same percentages of lethality and of phenocopies whether given at high or low intensities. The threshold level for phenocopy production varies with the age of the fly irradiated but is about 440 ergs/mm<sup>2</sup>. A comparison is made of this threshold with the thresholds for the effect of ultraviolet on other biological systems and with the effect of X-rays on phenocopy production in *Drosophila*.—*C. A. Villee.*

13376. White, W. T., Ralph W. Phillips, and E. C. Elting. (U. S. Dept. Agric., Washington, D. C.) *Yaks and yak-cattle hybrids in Alaska*. *Jour. Heredity* 37(12): 355-358. 2 fig. 1946.—The conditions to which the yak and yak-cattle hybrids are adapted are described, and the area in Alaska in which these animals might be useful is outlined. Nine yaks were taken to Alaska and some offspring and some hybrids with Galloway cattle were produced there. In close quarters at a low elevation the animals did not thrive well, but they improved when moved to open range at 1,200 to 2,500 ft. elevation. They were able to stay in satisfactory condition throughout the winter in the open, although the hybrids appeared to have less ability than the yaks to withstand extreme cold. Milk production was higher and carcass quality more satisfactory in the hybrids than in the yaks. Illustrations of typical yak, Galloway and F<sub>1</sub> animals are presented.—*R. W. Phillips.*

13377. Woolley, George W., and M. M. Dickie. (Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.) *Fuzzy mice*. *Genetics* 32(1): 113. 1947.—An abstract. Observations on mutant fuzzy mice in the CFW stock of Carworth Farms suggest that fuzzy is a unit recessive gene, for which the symbol *fz* is suggested.

## MAN

13378. Abramson, Harold, and Leonard D. Kurtz. (Beth Israel Hosp., N. Y. C.) *Familial glycogen disease. Report of four fatal cases of the hepatic form of the disease in siblings of one family*. *Amer. Jour. Dis. Children* 72(5): 510-520. 1 fig. 1946.—The histories and postmortem protocols of 4 siblings of Jewish parentage who died during very early infancy from glycogen storage disease of the von Gierke form are detailed. No evidence could be found of direct transmission of the disease from the parents; nor could consanguinity of parents be demonstrated. Of 6 children in the family 4, 1 brother and 3 sisters, were affected, the signs and symptoms in each dating from birth. Considerable enlargement of the liver was shown by roentgenography in 2 siblings at birth, suggesting a congenital origin of the disease. Abdominal distention, enlargement of the liver and respiratory distress were among the outstanding symptoms shown by the infants. All 4 cases had rapidly fatal outcomes. One infant died on the 4th postnatal day, 2 died at 3 months of age and 1 died at 4 months of age. In the latter 3 siblings, death took place in 20-48 hrs. after admission to the hospital. Death was probably caused by the intractable acidosis accompanying the infection. Postmortem studies in 2 babies showed microscopic changes in the tissues characteristic of the von Gierke form of glycogen disease. A review of the pathologic slides obtained from another hospital 5 and 10 yrs. after death of the other 2 babies revealed changes in keeping with the diagnosis of glycogen disease. The results of chemical analysis of the organs of one of the babies for their glycogen and lipid contents are given.—*Harold Abramson.*

13379. Child, George P., K. Rawls, and W. K. Hall. (U. Georgia Sch. Med., Augusta.) Alcaptonuria through seven generations. *Genetics* 32(1): 82. 1947.—An abstract. This defect in amino acid metabolism is usually inherited as a recessive and is alleged to be more prevalent in ♂♂. The present study adds 16 hitherto unreported cases, 11 of which are still alive, and whose metabolism is being studied. Of the 16, 10 were ♀♀.

13380. Estren, S., John F. Suess, and William Dameshek. Case report: Congenital hypoplastic anemia associated with multiple developmental defects (Fanconi syndrome). *Blood Jour. Hematol.* 2(1): 85-93. 1947.—A case of congenital hypoplastic anemia in association with other congenital defects was noted in an 11-yr.-old white girl.—R. Isaacs.

13381. Gilse, P. H. G. van, A. B. Hinnen, and A. C. Nieuwenhuijse. (U. Leyden, Holland.) Heredity in diseases in the field of oto-rhino-laryngology. *Bibliogr. Genetica [Gravenhage]* 13(4): 301-424. 46 fig. 1942.—The authors attempt to give an account of the data assembled up to that time concerning heredity in the field of oto-rhino-laryngology. Chapters are devoted to: (A) Diseases of the throat, trachea and bronchi, speech included (acute tonsillitis; idiosyncratic edema of the larynx; malformations such as diaphragma laryngis and fistulae of the larynx; stuttering; anatomical variations of trachea and bronchi). (B) Diseases of the nose (idiosyncrasies such as pollen allergy and rhinitis vasomotoria; ozena; hereditary multiple teleangiectases of the skin and mucous membranes; anatomical variations of the nose and nasal sinuses). (C) Diseases of the ear (affections of the outer ear such as defects of auricle, atresia of the external meatus, and fistulae of the outer ear and neighboring parts; affections of the middle ear, e.g., variations in pneumatization; affections of the inner ear such as otosclerosis and its relation to osteopsathyrosis and blue sclerae, and affections of the membranous labyrinth, i.e., congenital hereditary recessive deafness and its correlation with dystrophia retinae pigmentosa and hereditary dominant inner ear deafness). The following problems are also discussed in this connection: frequent coincidence in families of deafness and cretinism—pseudo heredity; etiology of so-called hereditary deaf-mutism; diagnosis of heredity in diseases of the throat, nose and ears; sterilization; consanguineous marriages; interruption of pregnancy. There is also a chapter on the inheritance of deafness in animals.—G. Östergren.

13382. McNutt, C. W. (U. Wisconsin, Madison.) Variability in the expression of the gene for brachydactyly in man. *Jour. Heredity* 37(12): 359-364. 3 figs. 1947.—A family is described in which brachydactyly is inherited through 4 generations in 3 sub-lines. This case is unusual in that the hands are more extensively affected than usual, comprising a reduction in size and number of the phalanges, extra segmentation and ankylosis of phalanges, reduction of length of metacarpals and metatarsals, and changes in the carpal bones and distal ends of radius and ulna. The condition is transmitted as an autosomal dominant. Brachydactyly in the chicken, mouse and rabbit is transmitted as a recessive character, but on the other hand it is quite similar to brachydactyly in man in that the expression is extremely variable in both extent and pattern and there are some "normal overlaps". In the mouse and rabbit brachydactyly has been shown to be a secondary result of developmental abnormalities which affect chiefly the extremities and other organs also in the case of the mouse. A similar origin is postulated for human brachydactyly bringing the many patterns which have been described as individual types within the scope of one autosomal dominant gene with varying expressivity and reduced penetrance.—C. W. McNutt.

13383. Njå, Arne. (U. Oslo, Norway.) A sex-linked type of gargoylism. *Acta Paediatrica [Uppsala]* 33(3/4): 267-283. 5 fig. 1946.—The author traced gargoylism in a family through 3 generations (diagram). An apparently healthy, normal couple had 11 children, 6 ♂♂, 5 ♀♀. Of the 6 boys 1 was normal and 5 (certainly 3 and probably 2) were affected with gargoylism. Of the 5 normal girls, 4 married normal men. One had 2 sons, a gargoyl and a questionably affected boy. A 2d had a son with gargoylism and a normal daughter. Another had only one son, a gargoyl. The fourth had only a normal daughter. The normal boy had 2 sons, both normal. It appears, therefore, that the 8 cases of gargoylism, all ♂♂, were inherited from

mothers who were bearers of the trait. Both the normal daughters of the 3d generation may carry on the trait to the next. Case histories are given of 5 of the boys examd., with photos of 3. A 6th case of a 4½-yr. girl, unrelated to the above family, with symptoms of gargoylism (photo) is also described. None of 5 boys had cloudy corneas, mentioned in the literature, which indicates that there may be a special sex-linked type of gargoylism where the corneas are normal.

13384. Schott, H. (U. Graz, Austria.) Zum Erbgang des Keratoma hereditarium palmare et plantare. [Inheritance of keratoma palmare et plantare.] *Arch. Derm. u. Syph.* 183: 663-682. 14 fig. 1942-43.—Report of a study of 75 named descendants of a ♀ who had a growth of horny tissue on the hands and feet (keratoma palmare et plantare). According to family documents the condition was inherited by a number of both ♂♂ and ♀♀. The date of birth and the incidence of keratoma is recorded. Since families in 3 generations were large (12, 13 and 15 children) and dates of birth known, it was possible to make graphs indicating the time intervals at which children were born and the month of conception. Each graph has the form of a sine curve, i.e., a curve whose ordinates are proportional to the sines of the abscissas. It is the graph of the equation  $y = A \sin X$  where  $A$  is the amplitude. The waves are uniform with equal heights above and below the abscissa line representing the months. The normal conception rhythm (Generations rhythm) appears to be a period of 2½ yrs. (30 mos.). Three intervals are shown:—normal, transitional and abnormal; 12 figures of 2 graphs each show the incidence of keratoma in children born to different ♀♀ during these 3 intervals. The explanation of the intervals is very complicated and requires the graphs and names of individuals indicated to follow Schott's reasoning. It appears, according to his calculations, that children conceived during an abnormal or transitional interval of the conception rhythm are more likely to have the skin abnormality than those conceived during the normal interval. It is suggested that families subject to keratoma keep a calendar of conception intervals and determine the most favorable time to avoid passing on the trait if either parent has it. It will be a time within the arc of the top of the curve or wave representing the normal interval.

13385. Snyder, Laurence H. (Ohio State U., Columbus.) Recent advances in medical genetics. *Ohio Jour. Sci.* 46(4): 216-219. 1946.—A brief summary of the recent advances in medical genetics.—L. H. Snyder.

13386. Strandkov, Herluf H., and Earl W. Edelen. (U. Chicago.) Monozygotic and dizygotic twin birth frequencies in the total, the "white" and the "colored" U. S. populations. *Genetics* 31(4): 438-446. 1946.—Estimations of the proportions of monozygotic and dizygotic twin births in the total, the "white" and the "colored" U. S. populations are presented. The respective estimated monozygotic percentages are 33.46, 34.17 and 28.89. Hence it may be seen that about 1/3 of all twins in U. S. populations is monozygotic rather than 1/4 as usually stated. The racial difference indicated is statistically significant. Although it is shown that the "colored" population has a significantly lower proportion of monozygotic births among twin births, it has been shown previously that it has a significantly higher percentage of twin births among all births. This is shown to be due not only to more dizygotic twin births but also to more monozygotic. The causes of racial differences are briefly discussed.—H. H. Strandkov.

13387. Strandkov, Herluf H., and G. J. Siemens. (U. Chicago.) An analysis of the sex ratios among single and plural births in the total, the "white" and the "colored" United States populations. *Amer. Jour. Phys. Anthropol.* 4(4): 491-501. 1946.—The sex ratios among single, twin, triplet and quadruplet births within the total, the "white" and the "colored" U. S. populations from 1922 to 1936, inclusive, are presented. It is shown that the % of ♂ births decrease significantly with each increase in number of embryos per pregnancy. Two explanatory hypotheses are suggested. One is that with increased competition the ♂ embryo tends to be eliminated early to a greater extent than what is true for ♀ embryos. The other is that ♀ determined zygotes tend to twin, triple or quadruple to a greater extent than do ♂ determined zygotes. The first hypothesis is favored. The percentage of ♂♂ among live births and stillbirths combined is significantly lower among single, twin, triplet, and



quadruplet births within the "colored" population than among the corresponding births of the "white." These racial differences probably are due primarily to racial genetic factors but probably also to some extent to racial environmental factors. The % of ♂♂ among "colored" single stillbirths is significantly larger than that among "white" single stillbirths. This racial difference probably is due largely to racial environmental differences.—*Auth. (courtesy Wistar Bibl. Serv.).*

13388. Tschermak-Seysenegg, A. Versuch einer Mendelischen Erklärung des Geschlechterverhältnisses der menschlichen Neugeborenen. [An attempt at a Mendelian explanation of the sex ratio of new-born human babies.] *Zool. Gen. [Vienna]* 14: 542-551. 1 fig. 1939.—The author suggests a new explanation of the excess of boys among new-born babies in the approx. ratio of 106:100, taking the following premises: 1) a general bisexual disposition of all terminate gametes, 2) a gradation in realization of sex determination according to M. Hartmann, and 3) an equal number of both kinds of ♂ cells (X and Y) and of homozygotic (XX) and heterozygotic (XY) zygotes, the 2d X checking the realization of ♂ potency. As an explanation of the deviation of phenotypic sex ratio from the theoretical 1:1 ratio and the gradation of sex character, the author postulates, in addition to the chief factor *F* located in the X chromosome,

a trifactorial difference (*A*, *B*, *C* or  $A > B > C$ ) backing unspecifically the disposition given by heterochromosome possession (XY or XX). The ratio of 106:100 suggests "association-dissociation" between pairs of factors present on both sides.—*Max Onno.*

13389. Wiener, Alexander S., and Eve B. Sonn. The Rh series of genes, with special reference to nomenclature. *Ann. New York Acad. Sci.* 46(9): 969-992. 2 fig. 1946.—The adaptability of the original nomenclature of the Rh factors to new findings is emphasized and the evolution of knowledge of the Rh blood types is described. To date there is evidence of 3 Rh factors and one Hr factor. The Rh', Rh", Rh<sub>0</sub> and Hr factors are based on serologic and genetic properties of these factors. Studies made on available family and statistical data were found to be in accord with the theory of 6 standard allelic Rh genes. Rare deviations from the theoretical expectations are explained by postulating the existence of 2 additional allelic genes, R'h' and Rh<sub>12</sub> corresponding to genes Rhy and Rhz or Race et al. These genes appear to be rare among white individuals, but occur more frequently among Mexican Indians. The problems raised by the existence of these genes, in relation to the genetic theory, and the problems of nomenclature are discussed.—*Sister M. A. McDowell.*

## BIOMETRY

JOHN W. GOWEN, *Editor*

See also Entries 13328, 13329, 13613, 13695, 13710, 13762, 13770, 13783, 13789, 13812, 13880, 13911, 13944, 14037, 14074, 14075, 14330, 14432, 14444, 14479, 14497, 15319)

13390. Ayyangar, A. A. Krishnaswami. (Mysore U., India.) On 'statistical inference'. *Half-Yearly Jour. Mysore Univ. Sect. A.* 8(1): 23-32. 1946.—This paper reviews the ideas on statistical inference by Pearson, Fisher, Wald, and Scheffe.—*J. W. Gowen.*

13391. Biehler, W., und H. Wohlschnitt. Beitrag zur statistischen Beurteilung biologischer Wirkungen. [Statistical evaluation of biological effects.] *Arch. Exptl. Path. Pharmacol.* 198: 278-291. 1941.—The importance of considering strains of variable sensitivity in exptl. animals in the case of asymmetric statistical distribution is emphasized.—*Sz. Donhoff.*

13392. Durante, D. Co-ordination of principles useful in estimating crop yields. *Month. Bull. Agric. Sci. and Pract.* 37(3/4): 33T-48T; (5/6): 61T-74T. 1946.—Agroscopy, or the methods of finding agricultural output, involves the following principles which are discussed: independent action of factors; tendency to equilibrium in intensity of factors; light intensity; correlation between inner nit area of soil and yield; inverse ratio between yield and energy used by root expansion; effect of crumbling and aeration on water retention; relation between permeability and quantity and quality of electrolytes and colloids; compensation between permeability and slope; indirect action of factors on constantly harmful influences; competition among mixed crops; correlation between richness of soil and assimilable quantities; means for increasing yields. Statistical treatment is given with examples. Agroscopy will indicate best crops and their proper treatment.—*R. O. Earl.*

13393. Hudig, J., en A. C. Schuffelen. De betrouwbaarheid, nauwkeurigheid en kostprij der analyse by het landbouwkundig onderzoek. [Reliability, accuracy and expenses of analysis in agricultural research.] *Landbouwk. Tijdschr.* 1942(671): 772-790. 1942.—Results of agricultural research are often given in figures of a precision far beyond necessity. An accurate method of known exactness maintained throughout the series of research is required but, according to circumstances, errors of 1%, in many cases of 10% and sometimes even of 30% are admissible. A tolerably reduced accuracy within these limits might save much time and cost in analysis.—*J. Rietsema.*

13394. Jaspén, Nathan. Serial correlation. *Psychometrika* 11(1): 23-30. 1946.—Formulas are presented for serial correlation, quadriserial correlation, etc., and for serial correlation in general. These formulas are based on self-known procedures outlined by Kelley, Peters and van Voorhis, and others, and involve Pearson's correction

for "broad categories." The formula for biserial correlation also may be developed following these procedures. The assumptions underlying serial correlation are that the segmented variable is basically continuous and normally distributed, and that all the segments which together would form a whole normal distribution are present.—*Nathan Jaspén.*

13395. Koopman. Grafische proefveldverwerking. [Graphic experiment field registration and judging]. *Landbouwk. Tijdschr.* 1946(700): 465-466. 1946.—Narrow plot strips are recommended, 1st yr. single, 2d yr. 3-fold, 3d yr. 5- to 6-fold and 4th yr. 5- to 6-fold or double standards.—*J. Rietsema.*

13396. Laderman, Jack, and Milton Abramowitz. Applications of machines to differencing of tables. *Jour. Amer. Statist. Assoc.* 41(234): 233-237. 1946.—This paper is largely concerned with the excellent way in which the important problem of finding differences for tabular entries can be handled by the Underwood-Elliott Fisher Sunstrand Accounting Machine, Model D. All differences up to the 8th of 12 digit entries can be simultaneously calculated and printed. A binomial method for easy calculation of the *n*'th difference is mentioned. This would be useful to those who have access only to ordinary machines.—*I. W. Burr.*

13397. Pérez Calvet, Ricardo, Manuel M[ari]a Zulueta, y Angel Anós. Experimentación agrícola. Fundamentos estadísticos y métodos operatorios. [Agricultural experimentation. Statistical fundamentals and operating methods.] 272p. Inst. Nacion. Investigaciones Agronómicas: Madrid, 1943.—In the first part of the book a complete review is given of the theoretical principles for the common statistical procedures. Under the different chapters discussions are presented on: Frequency distributions; Statistical parameters; Normal and binomial theoretical distributions; Theory of the errors; Correlation and regression; Sampling; "χ<sup>2</sup>," "t," "z," and "F" distributions. Original expts. done in Spain are discussed to illustrate the presentations. The 2d part is devoted to field designs. The importance of size, shape of plots and number of replications is emphasized with the presentation of randomized blocks, latin square, split-plots and factorials. Under the heading: Other experimental methods, checker-board design, large plot method, "standard" method and Mitscherlich method are presented. Useful tables complete the book. The book presents, in Spanish, a rather complete summary of the more recent advances in statistical analysis of agronomic expts., and as such should be particularly useful to Spanish speaking students.—*A. Grossmann.*

13398. Reynolds, Wm. A. A prepunched master deck for the computation of square roots on IBM electrical accounting equipment. *Psychometrika* 11(4): 223-238. 1946.—This paper presents a prepunched deck of cards to enable the extraction of square roots on standard punch card tabulating equipment. Such a deck is valuable in constructing mathematical tables which involve square roots or in obtaining standard deviations in connection with computing correlation coeffs. By using a deck of reciprocals in conjunction with the deck for square roots, correlations may be solved completely on IBM equipment.

13399. Stol, J. J. Dykveid. Oogstformuleering. [Formulating yield.] *Landbouwk. Tijdschr.* 1944(688): 232-256. 7 fig. 1944.—In an earlier paper the author published the formula  $y = 2fXx - fx^2$  or  $(Y-y) = f(X-x)^2$  for the crop-fertilizer relation. Its curve is liable to horizontal and vertical displacements and to curve crossing resulting in shifts of minimum and optimum. Such cases have actually been found. From pH curves it could be shown that the crop deficit must be proportional to the H-ion conc. For some  $K_2O$ ,  $P_2O_5$  and N curves, the actual crops usually differed <1% from the crops calculated by the formula. The higher value of manurial series compared to parallels is the result of the calculation.—I. Rietsema.

13400. Swineford, Frances. (U. Chicago.) Graphical and tabular aids for determining sample size when planning experiments which involve comparisons of percentages. *Psychometrika* 11(1): 43-49. 1946.—Charts are presented which eliminate any computation where the 2 groups involved are to be equal. A table is included for the case where one group will be 1-3 times the size of the other. The

charts are also useful for determining whether or not obtained differences are statistically significant at the 5% or the 1% level.—Frances Swineford.

13401. Uven, M. J. van. Correlatie. I. [Correlation. I.] *Landbouwk. Tijdschr.* 1943(682): 622-629. 8 fig. 1943.—Mathematical discussion of correlation between 2 variables.—I. Rietsema.

13402. Uven, M. J. van. Correlatie. II. [Correlation. II.] *Landbouwk. Tijdschr.* 1943(682): 630-638. 8 fig. 1943.—Mathematical discussion of correlation between 3 variables.—I. Rietsema.

13403. Waugh, F. V. The computation of partial correlation coefficients. *Jour. Amer. Statist. Assoc.* 41(236): 543-546. 1946.—Given that the partial regression of  $x_1$  on  $x_k$  is  $b_{1k}$  and its standard error is  $S$ , the partial correlation

coefficient,  $r_{1k}$ , is:  $r_{1k} = \frac{b_{1k}}{\sqrt{b_{1k}^2 + N' S^2}}$  where  $N'$  is the number of degrees of freedom. Examples from Ezekiel's text show that this method of computation saves much labor as compared with the "Doolittle method." The above formula is derived.—L. C. Cole.

13404. Weichelt, John A. A first-order method for estimating correlation coefficients. *Psychometrika* 11(4): 215-221. 1946.—A rapid method of estimating a correlation coeff. is given. The method expresses the correlation coeff. as the ratio between 2 differences in sums (or means) of the dependent variable computed only for extremes of the bivariate distribution. A trial shows that this method gives results similar to the product-moment correlation. Extensions of the method to qualitative data are also suggested.

## APPARATUS AND TECHNIQUE

PETER GRAY, Editor

(See also Entries 13671, 13673, 13676, 13679, 14456, 14457, 14458, 14460)

### MICROSCOPY AND TECHNIQUE

13405. Cross, Joy Barnes, and Dorothy Eben. (U. Texas Sch. Med., Galveston.) A safe and easy method for the serial transfer of minute specimens through various reagents into paraffin. *Jour. Parasitol.* 33 (1): 86. 1947.—A method of affixing mites, tissue fragments, etc., to paper slips and of maintaining the orientation of the specimens is described.—Authors.

13406. Laporte, L. J. Ce qu'il faut savoir du monde microscopique. Méthodes de récolte, d'examen et de préparation. Éléments de microphotographie. [What one should know of the microscopic world. Methods of collection, examination and preparation. Elements of microphotography.] 315p. Illus. Paul Lechevalier, Ed.: Paris, 1946.—This book is written less for the professional biologist than for the individual who, owning a microscope, desires to make himself acquainted with the most interesting objects of the plant and animal kingdom and to preserve them in a permanent form. Many of the methods and formulae described are nowadays little known to the professional, and the book can be recommended to all who make microscope slides, whether for instruction or for pleasure. A preliminary chapter discusses the microscope and the method of using it and is followed by methods of collection, examination, and temporary preservation of any form likely to be found. Two further chapters on small plants, which combine in about equal parts technical descriptions of the form found, methods for their identification and methods for their preservation and study. The next chapter on diatoms will prove of value to anyone interested in the group. The next chapter deals with the lower invertebrates and is followed by a chapter on insects. The book concludes with a very well written chapter as an introduction to photomicrography.—Peter Gray.

13407. Nelson, Olin E. (U. Pennsylvania, Philadelphia.) The use of dimethoxytetraethylene glycol and triethyl phosphate in histological technic. *Stain Technol.* 20(4): 131-132. 1945.

13408. Anonymous. Simplification of fluorescence microscopy. *Lab. Digest* 10(9): 14. 1947.—Principally a discussion of an improved triple stain which is designed to overcome weak illumination common in using the binocular microscope in fluorescence microscopy. The stain employs

auramine O S; rhodamine B S; and acridine yellow. The technique perfected by G. C. Hughes (*Tubercle* 27: 91-92. 1946) follows the standard smear routines used in bacteriology. The technique is rapid and accurate in examining large numbers of smears.—Robert Rosenbaum.

### LABORATORY APPARATUS AND TECHNIQUE

13409. Brewer, John H. (Biol. Res. Lab., Hynson, Westcott and Dunning, Inc., Baltimore, Md.) A simple pipette washer for the average laboratory. *Jour. Amer. Pharm. Assoc. Sci. Ed.* 35(11): 325. 1 fig. 1946.

13410. Evans, U. R. A simple device for preventing the formation of hard deposits in laboratory stills fed with water partially softened by base-exchange treatment. *Chem. and Indust. [London]* 1946(49): 434-435. 1946.—The device consists of Zn and Cu plates arranged in pairs or a glass framework, which is supported in the heating vessel so that there is no electrical contact with the walls of the vessel. Each pair of plates comprises a Cu and a Zn plate held firmly together, face to face, by means of narrow strips of Zn. After this device had been installed in a still, no trouble was experienced in removing deposits of scale during a period of 13 months. Practically all of the  $CaCO_3$  was brought down as a light, fluffy sludge, which could easily be removed from the still.—W. M. Holman.

13411. Anonymous. Bimetal thermometer. *Indust. Equip. News* 14(11): 26. 1 fig. 1946.—With auxiliary maximum-or-minimum pointer. Source: Weston Electrical Instrument Corp., 610 Frelinghuysen Ave., Newark 5, N. J.—M. A. Raines.

13412. Anonymous. Air conditioner. *Indust. Equip. News* 14(11): 52. 1 fig. 1946.—Delivers air at dry-bulb temp. of 40° to 120°F with humidity of 92-100% at 40°F or 22-98% at 120°F. Source: American Instrument Co., 8048 Georgia Ave., Silver Spring, Md.—M. A. Raines.

13413. Anonymous. Radioactivity meter. *Indust. Equip. News* 14(11): 53. 1 fig. 1946.—Applies with suitable equipment to receive impulses due to radioactivity and to operate various types of electro-mechanical impulse registers and a counting-rate meter Pulse-amplitude discriminator in input circuit can be set within  $\pm 1\%$  for pulses between -50 and +100 volts. Pulses together within 5 microseconds

es among the 3 groups; 3) "primitive" characters common to the 3 groups; 4) "non-primitive" characters common to the 3 groups; 5) secondary sex differences in the column of the Bushman. He notes the absence of C and L lordosis (the intervertebral disks having been removed, the spine presenting its entire length an anterior concavity). In the living, this reflected in a weak C and L lordosis which causes poor balance in erect posture. The slight flexing of the knees in the standing position that is observed among these people is, according to the author, necessary to compensate for this imperfect balance. He also points out that the spinous processes of the cervical vertebrae among his African series are very rarely bifid—a characteristic of the most primitive man groups. Among the Bushman, sex differences in the vertebral column are surprisingly weak—a phenomenon he attributes to the rigors of nomadic life which affect either sex the same degree. Among the Bushman ♂♂ the absolute and relative dimensions of the C and T regions are greater, the L region, as in most human races, is longer in the ♀♀ relative to the total vertebral length. Bushman ♀♀ vertebral columns show, in addition, greater absolute dimensions than ♂♂ in various diameters and ant. hts. of L-1 to L-5. The author attributes these peculiarities, totally absent among other populations, to: the great development of the L region in Bushman ♀♀ (steatopygia); the requirement of more solid bony attachments for the increased musculature required to support the wt. and constant traction of the steatopygic condition.—*B. S. Kraus.*

13440. Fleuriot, A. Les Babinga de Mekambo (Gabon). *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 101-116. 3 figs. 1942.—Over 100 Négrillos from the equatorial forest of Gabon, 1° N of the Equator, were measured, and yielded the following results for which  $N = 53$  ♂ and 43 ♀: av. stature 7.9 and 148.3; av. sitting height 83.3 and 78.6; rel. sitting height 52.7 and 53.04; span 171.5 and 159; rel. span 106.78 and 106.81; thoracic circ. 83.9 and 77; rel. thoracic circ. 51.1 and 51.9; the ponderal index of Livi was 23.3 and 23.6, the wt. was only taken approx. The nose is often broad at the alae. The lips, esp. the upper, are often much thinner than among the neighboring pops. Many cultural observations having to do with dress and mutilations were made; these clearly showed influence from neighboring Negro peoples. Especially interesting were teeth filing and evulsion and tattooing. A note by Dr. Pales compares the Babinga with the Babinga studied and with nearby peoples. Although the Babinga show considerable heterogeneity and mixture with other peoples is suspected, the possibility of original multiple types of Babinga (indicated by the suggestion of parallel development of the 2 sexes) can not be ignored.—*F. Ewing.*

13441. Gan, J.-K. (*l'École pratique des Hautes Études, Paris*). Contribution à l'étude des dents chez les anthropoïdes. II. Un cas de carie sur les incisives médianes supérieures chez le chimpanzé *Pan satyrus* versus Schwarz(?). I. Présence d'une prémolaire supérieure vestigiale droite chez un gorille (*Gorilla gorilla* Wyman). *Bull. et Mem. Soc. Anthropol., Paris* 9th Ser. 3: 56-61. 2 figs. 1942.—The ♂(?) specimen was collected at Camoo, Ivory Coast. Caries has not been reported from fossil anthropoids; is fairly common among recent chimpanzees and orangs, but rare among gorillas. Literature on % of caries for individual teeth is lacking. In the skull of this specimen all the sutures are obliterated, showing considerable age. The incisors are very worn. Of the cheek teeth, all the buccal cusps are unworn, except for light wear on those of R M1; the lingual cusps, especially on the right, are very worn. Caries occurs at the gum line, a phenomenon previously thought specific to Neolithic man. Caries is not specifically human, or primate, but has been recorded of many mammals. The figures given by Vallois (33%) show greater incidence among civilized man than among fossil men; Schultz' figures for recent chimpanzees (29.2%), however, are not greatly exceeded by those of civilized man. This is difficult to explain; also difficult is the fact that the figures for wild chimpanzees so far surpass those for wild gorillas.—III. Supernumerary teeth are very rare among the Primates, even more so among the Catarrhines, and particularly rare among the anthropoid apes. This specimen comes from Gabon. The tooth in question is a vestigial R PM, intercalated between

the C and PM2. Except for the absence of PM1, the dental formula is normal. There is slight wear on the vestigial Pm.—*J. F. Ewing.*

13442. Garber, Clark M. Eskimo infanticide. *Sci. Month.* 64(2): 98-102. 1947.—The Eskimos had no native knowledge of abortion; but they killed all deformed children, one of every pair of twins, and other babies, especially when forced to move by lack of food, usually by smothering. They killed girls rather than boys. Some groups have found that they had gone too far in this.—*H. F. Copeland.*

13443. Hermeto, Abdon, e Osvino Pena Sobrinho. A incidência da drepanocitemia (sickle cell trait) em Belo Horizonte. [The incidence of the sickle cell trait in Belo Horizonte, Minas Gerais, Brazil.] *Arg. Inst. Quim.-Biol. Est. Minas Gerais* 1: 121-123. 1945.—Among 200 pupils of an elementary agricultural school in Belo Horizonte, Minas Gerais, Brazil, the authors found 8 cases of sickle cell trait, without anemia. Of these, 5 were mulattoes (in 92 surveyed, or 5.43%), and 3 were Negroes (in 36 surveyed, or 8.33%). No case was found in 72 whites examined.—*Auth. abst.*

13444. Hooton, Earnest Albert. Up from the ape. rev. ed. 788p. Illus. MacMillan Co.: New York, 1946. Pr. \$5.—The 2d edition of Hooton's book has been extensively rewritten in conformity with the rapid progress in physical anthropology since the writing of the 1st ed. Furthermore it is now addressed more particularly to students at the college level. The original division of 5 parts is basically preserved and a 6th—The Anthropology of the Individual—has been added, plus a brief laboratory manual of anthropometry (including Sheldonian somatotyping). The bibliography has been brought up to date. Some of the text-figures and plates have undergone substitution, and there are 10 text-figures, 11 plates plus 2 photomicrographs more than in the 1st ed. also 9 fresh tables and lists. Each of the basic 5 parts has been revised; most extensively, parts 4 and 5. A complete enumeration is impossible here. Here are the most important: Part 2. Added: the pros and cons of the alternatives that man's ancestors were brachiators or pronograde ground-dwellers; and a distillate of Cummins and Midlo's *Finger Prints, Palms and Soles*. Part 3. Some alterations: Growth rhythms in peoples of warm climates do not show the relative precocity once attributed to them; a fuller discussion of primate sexology; additional discussion of vital statistics. Part 4: The treatments of *Pithecanthropus*, Piltown, *Sinanthropus*, Neanderthal have been revised and amplified in the light of more recent finds and studies (the newer *Pithecanthropus* specimens; Weidenreich's *Sinanthropus* studies; Steinheim, Saccopastore, Monte Circeo, Tangiers, Galilee, Mt. Carmel, Baisun). The Heidelberg discussion is reduced, with taurodontism no longer carrying its former weight; Rhodesia discussion is also reduced, and the matter of the specimen's being a Neanderthal variant is definitely repudiated. Added are special discussions of *Africanthropus njarasensis*; Solo; Ngandong; Talgai as the supposed antecedent to the Australians; the African finds; Choukoutien; Minnesota. Other revisions: Wadjak, Swanscombe, Galley Hill et al., Aurignacians, Grimaldi. The hypothesis of W. D. Matthew has been dropped. There are new and altered figures of the "family tree". Part 5: Raciology has been revised as drastically. Its title now is "Heredity and Race", with a new emphasis on genetics, including a lengthy preliminary treatment of the principles of genetics and their application to race classification. The race definition itself has been modified and amplified; likewise the classificatory system itself (which is too long to reproduce here); also problems of blood type, the physical criteria of race, the techniques of classification. The criteria have been rearranged as well as amplified or otherwise modified, and dermatoglyphics has been added to them. Racial types have been extensively reillustrated. Part 6 is a new section, predominantly an expansion of the Sheldon system of constitutional diagnosis.—*E. W. Count.*

13445. Kilgore, Samuel, and G. W. Lasker. (Duke U., Durham, N.C.) Cleidocranial dysostosis with psychosis. *Arch. Neurol. and Psychiat.* 56(4): 401-416. 3 figs. 1946.—Cleidocranial dysostosis is a rare developmental disease. In typical cases, such as those here reported, the fontanels are slow to close, leaving furrows along the suture lines, including the metopic. The head is large and wide compared to the



small face. The mandible is prominent but the teeth are slow to erupt and very irregular. The clavicles are absent, deficient or divided; the vertebrae are malformed; spina bifida is frequently present; the pelvis is distorted; and the phalanges are shortened. In fact, all of the bones are sometimes affected though none of the signs is present in all cases. The condition ordinarily is inherited as a Mendelian dominant. Its incidence is similar in the 2 sexes and in all races and age groups. In few cases were the patients suffering from mental disease. One of the individuals reported here was mentally normal. The other, his son, though less deformed by the dysostosis, had schizophrenia, was suspicious and had hallucinations. The psychosis manifests connection with the dysostosis only in certain portions of the content and differs in no essential way from the recognized form of schizophrenia. It is evident that the patient's psychologic reactions to his peculiar physical appearance provided the basis for much of the color of the content. This is in agreement with the impression one gets from a reading of the previously reported cases. In the few persons with mental disease no constant relationship to the dysostosis has been established. The incidence of minor psychiatric disorders in persons with cleidocranial dysostosis is even less frequent than one might have expected considering the social implications of such prominent physical abnormalities.—G. W. Lasker.

13446. Koenigswald, G. H. R. von. Search for early man. *Nat. Hist. [New York]* 56(1): 8-15, 48. 15 fig. 1947.—Most skeletal fragments of early man have been found by systematic searching. Working in Java in 1891-92 Dubois found a portion of skull and a complete femur which he combined to give the surprised world "*Pithecanthropus erectus*, a Humanlike Transitional Form from Java". Excavations in 1930 by the Geol. Survey of the Netherlands East Indies established the Trinil horizon, which contained the two fragments, as Middle Pleistocene. With the aid of the Survey, the late C. Ter Haar discovered 2 human skulls which might be classified as neanderthaloid. Duyfjes found a fossilized baby skull near Surabaja in 1926, and the next year Koenigswald and Haar found skull No. VI, the finest of the Solo river series of *Pithecanthropus*. These finds proved to all, excepting Dubois, that human beings existed in the Lower Pleistocene of Java. Later, Koenigswald selected from "dragon's teeth" in Chinese drugstores over 1500 fossil teeth of orangutans and other primates. Based on 3 huge molars, Koenigswald named a primate *Gigantopithecus blacki*. About 1938, Koenigswald found a nearly complete skullcap of *Pithecanthropus*, approx. 1 cm. thick. The new find resembled the first skull in detail and proved that *Pithecanthropus* belonged to the human family. However, Dubois stoutly maintained the opposite view. Koenigswald and Weidenreich found that the new skull closely resembled the Peking skull found by Black in 1929. Because skull No. IV in the series is larger and heavier than No. II or III, it was named *P. robustus* by Weidenreich. In 1941, Koenigswald named an enormous human jaw as belonging to *Meganthropus palaeojavanicus*. Three huge teeth, previously found, resembled human teeth. The new finds are about 500,000 yrs. old and indicate man's ancestors were giants—a conclusion wholly unsuspected until now.—G. H. Kelker.

13447. Lefrou, G., et M. Cazeilles. Contribution à l'étude d'Anthropologie radiologique: Application à l'étude du prognathisme chez les noirs. *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 62-73. 1 fig. 1942.—Use of X-rays allows of simultaneous study of the bony and soft parts of the head. Any type of machine will do, but care should be taken to place the subjects at the same distance from the source of the rays, the error then being the same for all. When the head is viewed in profile, the osseous contour of the skull, the glabella, the sub-occipital region, and sometimes even bregma, can be defined. The ext. aud. meatus may be marked by the introduction of a lead pellet. For the face, the profile of the frontal sinuses, nasalia, lower border of orbit, lower border of apertura piriformis, vault of palate, anterior profile of maxilla, prosthion, lower border of mandible, are all definable. In addition, the profile of the soft parts is discernible. The front view allows of determination of maximum breadth of skull and bizyg. diam. The various dimensions may be marked on the screen with a skin pencil. The points and outlines drawn on the screen may be traced on paper, on which measurements may be made. In applying

radioscopy to the study of prognathism, the angle of Camper (prosthion to anterior point of endocranial space, prosthion to anterior projection of chin), of Cloquet (prosthion to anterior endocranial space, prosthion to center of auditory meatus), and the sub-nasal radiographic angle (prosthion to center of auditory meatus, prosthion to anterior point of floor of nasal cavity) were taken. 50 Negroes, 3 Mongoloids, and 25 Whites (all ♂) were so examined. The angle of Camper seems to provide an excellent diagnostic, Negroes vs. Whites; the angle of Cloquet appears to provide no diagnostic; the sub-nasal angle shows well marked but overlapping differences. There is hope that radioscopy will restore interest in prognathism as a characteristic, which, added to others, can give a precise racial differentiation. The possibility of using this method for criminal identification, because of the impossibility of changing the osseous structure of the head, is great.—J. F. Ewing.

13448. Marneffe, H., et L. Bezacier. Les groupes sanguins en Indochine du Nord. *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 1-25. 6 fig. 1942.—Blood group studies were made on 1261 Annamites of the delta of the Red River: 506 Muong of the region of Vu-ban and Hoabinh; 576 Tho of Cao-bang, That-ke, Lang-son, Mon-cay; 112 Man of Binh-lieu; 81 Nung of Langson and Mon-cay; 121 of European and native parentage; and miscellaneous others. The percentages of groups O, A and B respectively were: Annamites, 41.25, 25.11, 33.67; Muong, 34.93, 29.57, 35.48; Tho, 43.35, 23.75, 32.89; Nung, 38.09, 28.57, 34.52; Man, 38.13, 31.44, 30.50; mixed, 36.22, 33.85, 29.92. The pop. of Tonkin (2,566, omitting mixed) gave % of 42.6, 21.5, 29.6. Thus, these people belong to Ottenberg's Afro-South Asiatic category. These investigations corroborate the general statement that group B tends the more to predominate over group A as one goes farther to the east and southeast of Asia. The various groups of Tonkin are closely related. The Tho are closer to the Annamite, a conclusion which is confirmed by history and ethnography. The Muong are less closely related to the Annamites, probably because of isolation. The Nung are probably closer to the Muong than to the Annamites, but the no. of subjects is insufficient for certainty. The Man, although belonging to the general group, differ from all the other groups equally. Comparing these results with those of Yang and Liu Heng Wang on the Chinese, it appears that the Annamites and the people of the Tonkin Mts. are more closely related, not to the present people of S. China, but to the Mongols of N. China. In general, the present subjects are related to the Malays, the people of Sumatra and the Javanese; particularly close is the relationship to the people of eastern Java, especially that of the Muong. The Man are a little closer to the Javanese in general and those of western Java in particular. The Annamites, the Tho and the Nung are equally distant from the Javanese, but belong to the same general group. The Tho, Sumatrans and Filipinos are closely related. The Annamites are the only ones of our group who resemble the Chinese more than they do the East Indians. There is a close resemblance between the Muong and the Ainu of Karafuto. The relationship between the North Indochinese and the Malagaches is not distant, although the latter have a higher % of A, and fall into the Intermediate category. In general, the Annamites, Tho, Muong, Nung and Man are more closely related to the Indonesian than the Mongoloid element. The subjects of European-native parentage inherit more from their Annamite than from their European parents, but fall into the Intermediate category.—J. F. Ewing.

13449. Neuville, R., et A. Ruhlmann. L'âge de l'homme fossile de Rabat. *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 74-88. 5 fig. 1942.—The portion of human maxilla and mandible found near Rabat, Morocco, in 1933, in a sandstone quarry of the quarter of Kheibat, cannot be dated from artifacts, of which none were found; the molluscan fauna of the area is not well enough known to furnish precise data; the analysis of the skeletal remains has not yet been published by Boule. Hence, dating, for the time being, has to be attempted on purely geological grounds. The conclusions of the geological study are as follows: the exposed base of the site is a marine complex, probably attributable to the sea level +55-60 m., i.e., the Milazzian. A superimposed dune layer indicates a regression of the sea and separates the base from another marine horizon, which probably was +28-30

m., i.e., Tyrrhenian. After the recession of this sea, the thick dune layer, which contained the remains, was formed. This dune was followed by a more humid climate, accompanied by a return of the sea, which reached +12-15 m. at many points on the Moroccan coast. Therefore, Rabat Man lived during the interpluvial period of Morocco which correlates with the Riss-Würm interglacial. This does not agree with the tentative dating of the Palestinian human finds, the fossils of Mount Carmel and Jebel Kafzeh probably belonging to the Mindel-Riss interglacial; this is interesting in view of the similarities between the Rabat and the Skhul and Jebel Kafzeh chins.—*J. F. Ewing.*

13450. Royer, M. P. Les ossements humains préhistoriques de Ferrussac (Hérault). *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 26-30. 1942.—These skeletal remains, which were found in the Commune of Saint-Martin, Hérault, will form part of a work now in prep. on the inhabitants of the Languedoc region after the end of the Paleolithic. The remains are mostly fragmentary. The most striking phenomenon among the cranial fragments is evidence of a skull with a min. frontal of approx. 28 mm. The skulls are evidently dolichocephalic. Four mandibles are of normal dimensions. Among the teeth, there is 1.41% of caries. The femora exhibit 57.14% of strong platynery; the tibiae 52.63% of mod. platynery. The femora of 9 ♂ and 8 ♀ indicate a stature (according to Manouvrier's method) of 1.6 m. and 1.53 m. respectively.—*J. F. Ewing.*

13451. Royer, M. P. Les ossements humains préhistoriques des Barasquettes (Hérault). *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 31-37. 1942.—The skeletal remains from the Commune of Pegayrolles-de-l'Escalette, Hérault, of the Chalcolithic or Bronze Age, include practically no short bones, which suggests secondary burial. Of the skulls, 7 are dolichocephalic, 1 brachycephalic, 1 sub-brachycephalic; 4 are leptorhin, 1 platyrhin, 2 undetd. All the faces are orthognathous. The mandibles present no abnormalities. Of 84 teeth, 7.14% were carious. The humeri generally show considerable torsion; their av. index of robusticity is 18.94 ♂ and 19.65 ♀. The femora show strong platynery, 2 out of 3 ♂, and 100% ♀. Comparing the femora and the tibiae, one finds that 3 out of the 9 ♂ femora are platyneric, while 6 of the ♂ tibiae are platyneric; all the ♀ femora are platyneric, while only 2 out of the 5 ♀ tibiae are platyneric, a situation which throws doubt on Manouvrier's attributing both platynery and platynery to the same cause. However, the no. of specimens in this case is small. Using the method of Manouvrier, ♂ stature is 1.67 m., ♀ 1.46 m.—*J. F. Ewing.*

13452. Rusconi, Carlos. Carenacia de caries dental en indigenas juveniles prehispánicos de Mednd Mendoza. [Lack of dental caries in juvenile inhabitants of pre-Spanish Mendoza.] *Rev. Odontol. [Buenos Aires]* 34(5): 175-179. 1946.—Caries is almost non-existent in the skulls of pre-Spanish juvenile inhabitants of the Argentine State of Mendoza. However, 50% of the present-day children who have only deciduous teeth, 50-55% of children 7-8 yrs. of age, and 90-95% of children 9-10 yrs. of age, have caries. Possibly the increased caries is the result of irregularities of arch formation. Malocclusion is common in present-day children but was virtually absent in the pre-Spanish residents. Orthodontic measurement of pre-Spanish skulls supports this belief.—*J. F. Folker.*

13453. Sauter, M.-R. Le Problème des Burgondes. *Arch. Suisses Anthropol. Gen.* 10: 1-137. 1941.—The author analyzes ancient and modern skeletons from Switzerland and France to reconstruct the history of the Burgundian people. He presents archaeological and historical evidence which attests to the Scandinavian origin of the Burgundians, ca. 700 B.C. By 200 A.D. the Burgundians had extended their territory to embrace Brandenburg and Lusace. A hundred years later they had reached the Roman "limes" after having mixed with their neighbors, the Goths, Gepids, Lombards, Vandals, and others. After 400 A.D. they became catholicized and mingled with the Romans. Their kingdom of Burgundy came to an end in 534 at the hands of Clovis' successors and from this point on the Burgundians lost their political and ethnic identity. The skeletal series used in this study are 203 crania and fragments of skeletal parts. Of the crania, 100 are ♂, 60 ♀, and 28 are doubtful. The material embraces the Iron Age, Gallo-Roman, Medieval,

and modern periods. The Iron Age material does not include Burgundians, who burned their dead during this period. For comparative purposes the author uses skeletal data gathered by other investigators relating to the Lombards, Gepids, Franks, Alamans, Bajuvars, Helvetians, and Gallo-Roman peoples of the Burgundian area. Iron Age skeletons of Scandinavia and Denmark are used to fill the gap caused by the lack of Iron Age Burgundian material. Relying heavily upon the C.I. and stature, he comes to the following conclusions: The Burgundians occupy, physically, a position intermediate between the Nordic Germans and Scandinavians on the one hand, and the Alpine Swiss and French on the other. They might be called "alpinized Nordics" or "nordicized Alpines." As the author reconstructs the physical history, the dolichocephalic Nordics from Scandinavia mingled with the brachycephalic Alpines (represented by the Valaisans and Savoyards) in the Iron Age to produce, in protohistoric times, a mesocephalic medium-statured population—the modern Burgundians.—*B. S. Kraus.*

13454. Shourie, K. L. (Nutrition Res. Lab., Coonoor, S. India.) Eruption age of teeth in India. *Indian Jour. Med. Res.* 34(1): 105-118. 3 fig. 1946.—An attempt has been made to estimate the eruption age of teeth in Indian population. 1886 children were examined in southern India (rice-eating area) and 1713 children in northern India (wheat-eating area). From the data collected, estimates have been provided for the eruption age of each tooth. The diffis. noticed in eruption ages between boys and girls are not very marked and those between boys of southern and northern India are also small. The figures obtained in India are similar to those of the U. S. A. There is an indication that eruption of teeth takes place somewhat earlier in India than in the U. S.—*K. L. Shourie.*

13455. Stout, D. B. Further notes on albinism among the San Blas Cuna, Panama. *Amer. Jour. Phys. Anthropol.* 4(4): 483-490. 1946.—The Cuna Indians of eastern Panama have long been known to exhibit a remarkably high degree of albinism. Reginald G. Harris made scientific field study in 1925 among the San Blas Cuna, the largest portion of the tribe. On the basis of genealogies and anthropometric study he concluded the albinos to be partial or imperfect albinos who expressed a homozygous recessive condition, and the result of a mutation in one or more genes rather than miscegenation with Caucasians. He estimated an incidence of ca. 0.69%, and suggested that the social organization allowed a high degree of inbreeding which permitted the propagation of albinos by phenotypically normal Cunas. In 1940 the present author confirmed Harris' genealogies and, on the basis of more accurate total population data and count of albinos, refined the incidence to ca. 0.47%. The author also describes the religious attitudes toward and social status of the albinos and, by outlining the structure of San Blas Cuna society, explicitly shows how the inbreeding necessary for the establishment and continuation of this genetic phenomenon has been brought about.—*Auth. (courtesy Wistar Bibl. Serv.).*

13456. Tchernia, M. P. Considerations d'anthropologie physiologique sur les Esquimaux. Alimentation. Maladies des voies respiratoires. Groupes sanguins. *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 44-55. 1942.—Observations were made for a year on the 127 inhabitants of Angmagssalik on the east coast of Greenland. The belief that the Eskimos live solely on fat, oil and meat is disproved by the fact that the people here eat large quantities of sea weed (algae; here esp. *Alaria pylei* and *Fucus serratus*), which supply roughage, vitamins A, D and (together with animal viscera and narwhal skin) C. Other vitamins are present in meat, fish, viscera. Many authors corroborate present findings that Eskimos do not suffer normally from diseases which would result from a diet deprived of sugars. Such sugars are derived from blood, viscera (especially liver), and red meat. The basal metabolism of Eskimos shows no provable racial or climatic peculiarity. Europeans introduce high calory foods, and in such regions there is a marked increase in rickets and tuberculosis.—Each year, in summer and at the visit of the supply ship, there is an epidemic of catarrh, sometimes with lethal complications. The Eskimos do not have racial immunity from diphtheria. On the west coast, the highest incidence of deaths is from tuberculosis; on the east coast there is a form of tuberculosis with the usual

clinical signs, but mild, and the patients can exercise considerable activity over a long period of yrs. Practically every ♂ over 30 is affected; the incidence among ♀ is less. The sputum examination did not show Koch's bacillus or the usual concomitants of tuberculosis, but only numerous mycelial filaments. As media and animals were lacking, further determinations could not be made.—Three physical types were distinguished: a Mongoloid type, an Indian type (longer nose and thinner lips), and a Melanesoid type (short, with thick lips, large flat nose, sometimes frizzly hair). The few blood group detns. made (21) corroborated the percentages of Fabricius-Hansen (569 subjects: O, 23.9; A, 56.2; B, 11.2; AB, 8.7). Consideration of the heterogeneity of the Eskimos and their rapidly changing way of life demand a complete investigation of these people by a well-planned program carried out by many scientists representing all possible disciplines.—*J. F. Ewing.*

13457. Vallois, H.-V., et G. Lazorthes. *Indices lombaires et indice lombaire total. Recherche sur la forme des vertèbres lombaires et des disques correspondants.* *Bull. et Mem. Soc. Anthropol. Paris* 9th Ser. 3: 117-131. 2 fig. 1942.—From a study of the vert. col. of 30♂ and 20 ♀ recent French and 15 Paleolithic and Mesolithic subjects, with regard to ant. and post. hts. of L5 and the corresponding intervertebral discs, it was found that the total L index was 101 ♂ and 97 ♀ for the French, and considerably higher for the Stone Age specimens. The indices of the individual vert. diminished regularly from LI-5; the change from above to below 100 being at III for ♂ and II for ♀ generally. The discs exhibited a total L index of 57.3 for ♂ and 53.1 for ♀.

None was found above 100. The conclusion was reached that it is the discs that play the predominant part in the curvature of the spine, not the bodies of the vertebrae. Conclusions, therefore, about the posture or spinal curvature of Stone Age peoples drawn from the vertebrae alone are hazardous.—*J. F. Ewing.*

13458. Weidenreich, Franz. (*Amer. Mus. Nat. Hist., N. Y. C.*) Generic, specific and subspecific characters in human evolution. *Amer. Jour. Phys. Anthropol.* 4(4): 413-432. 1946.—The discussion centers around the question as to whether the morphological characters recognizable in human evolution permit a clear objective distinction between genus, species, and subspecies. It is concluded that all the hominids, living and fossil—the latter so far as they are known today—represent only one species. The dissimilarities between the different groups are no greater than those found among subspecific variants and never rise above a subspecific level. Therefore, there is no justification for exaggerating these differences by nomenclature. Human evolution presents a typical example of "progressive evolution" or "rectilinear progression." The transformation of the body of the hominid consists of single correlated changes which succeed each other, but do not appear synchronously or in a fixed order. In addition to the correlated characters which concern the fundamental organization, there are others which are of secondary importance from the phylogenetic point of view. These involve, in particular, the exterior (skin and physiognomy) and may be combined with any phase and variation of the fundamental organization.—*Auth. (courtesy Wistar Bibl. Serv.).*

## ETHNOBIOLOGY

W. M. KROGMAN, *Editor*

(See also Animals eaten by pre-Columbian Indians, Martinique, 16169; Bird lore of the Cherokee, 16210; Grapes in ancient Egypt, 15358)

13459. Eidem, P. Datering av gammelt bygningstømmer fra Østbyhaug i Tydal. [Dating of timber from old buildings in Tydal, Trøndelag.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16: 95-98. 1 fig. 1943.—The annual rings were measured in 5 logs of Norway spruce from a building in a mountain valley in central Norway, which was known to have been repaired several times. Comparison with the dendrochronological standard curve from the neighboring district showed that the oldest log had been cut in 1727, and that it had started growing in 1494.—*O. A. Høeg.*

13460. Eidem, P. En vekstkurve til datering av trevirke av gran fra omegnen av Trondheim. [A standardized growth curve for the dating of spruce logs from the vicinity of Trondheim.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16: 115-117. 1 fig. 1943.—Measurement of the annual rings of 14 trees cut in the winter 1940-41 at Trondheim (near the coast), of which the oldest one had started growing in 1808, gave a standardized curve showing a very good correlation ( $0.74 \pm 0.05$ ) with the standard curve from Selbu, a valley about 50 km. away.—*O. A. Høeg.*

13461. Maldonado-Koerdell, M. Aztec botany and zoology. *Chicago Nat.* 9(3): 51-58. 1 fig. 1946.—Among the few authorities on the Aztecs are Troncoso, late Director of the Museum of Mexico, and E. Seler, the German naturalist. The Aztec mind was mystical, with a strong aesthetic sense. To them, plants represented spiritual pleasure; animals the reincarnation of deities, etc., and both had supernatural forces. Their interpretation was not scientific. The only record we have is from hieroglyphics and paintings. Their plant lore was systematic, as shown by distinctions in nomenclature: quahuil (tree), quaquauhtzin (shrub), xihuil (herb). The parts of plants and kinds of roots were itemized. Ecological conditions were expressed by using a qualifying prefix with a noun, e.g., the name atoyaxocotl for *Spondias* is based on the words atoyatl-xocotl, meaning river rapid. There were separate terms for simple or compound leaves. Synonyms were abundant, including regional and technical names. Their writing had a triple meaning: figurative, symbolical, syllabic or combinations. Daily contact with plants and animals erased fear, and they made practical use of some, e.g., they made paper, fibers, and roof

covering from the agave group. Feather work was an honorable profession. Animals had a totemic significance. The key is found in the hieroglyphics, e.g., the monkey represented pleasure and distraction, also singing, dancing, and sexual sin. Its agility made it a symbol for wind, for which a conventionalized face of a monkey was the sign. Reptiles were prominent. The human figure was usually secondary to animal figures or snakes in art. Some knowledge of morphology and life habits was gained through religious study.—*Miriam Dickinson.*

13462. Randhawa, M. S. Role of domesticated animals in Indian history. *Sci. and Culture* 12(1): 5-14. 4 fig. 1946.—The introduction to this popular article deals with the general evolution of plants and animals and the worldwide distribution of domestic animals; this part contains several factual errors. In historic times, the climate of n. central and n.-w. India was wetter in the pre-Christian period than later, so that the elephant and the buffalo were, with the dog, the dominant domestic animals of the region until the invasion of Aryan-speaking northerners about 1600 B.C. displaced the Negritos and Proto-Australoids southward, and replaced an elephant-buffalo culture with a horse-cow culture. The buffalo, however, due to its higher milk yield, its higher fat content, and its superiority as a draft animal, was never completely displaced, and gained at the expense of the cow, even during the desiccation of n. central and n.-w. India, and is the more common in the Punjab today. The camel (for which *Pantolestes* is erroneously stated to be the Eocene ancestor) was probably domesticated independently in Central Asia (Bactrian camel) and in N. Africa (Arabian camel); possibly, also, a separate center for the latter was in the Indus valley. The camel, as a bearer of trade goods, consolidated the Arabian Empire won on the horse. Prior to the Arabian invasion, the sheep and the goat (probably first domesticated in the mts. of Turkestan) and man were responsible for the destruction of the forests of n. central and n.-w. India, with consequent soil-erosion and desiccation. Thus open plains and deserts, suitable for invasion by Arab and, later, by Tatar cavalry, were created. The horse was the dominant domestic animal of n. India until sailing ships and cannon brought Europeans to power. In discussing the behavior of historic peoples, the author often



egards as biologically determined factors which more probably were culturally determined.—C. A. Reed.

13463. Sauer, Carl O. (*U. California, Berkeley*.) Early relations of man to plants. *Geogr. Rev.* 37(1): 1-25. 1 fig. 947.—The article deals with the time before there was any thought of planting crops. Fire was probably the earliest means by which man influenced the vegetation; fire was basic to the culture as early as the time of Peking man, or perhaps earlier. Wherever fire was used, the reproduction of plants and the composition of the vegetation were affected. Early weapons or tools served as well for the cutting and use of plant products as for the dressing of meat and skins. Brief occupation of a camp site had little permanent effect upon the vegetation; but long occupation of an area had profound effects. The land near a settlement was cleared. Camp sites and trails became packed and hard. The digging of edible roots stirred up the soil, a kind of cultivation, and

improved the opportunity for growth of some species. The chance dropping of seeds along trails may have accounted for the distribution of some forms. Plant associations became increasingly altered, even to the extent of the elimination of some spp. Man worked toward the removal of shade and this worked to the advantage of sun-loving spp. Most cultivated plants are sun-loving and the reduction of shade resulted in the production of greater amts. of food, and made it possible for the area to support a denser population. There was gradual replacement of heavy and deep-rooted trees and shrubs by fibrous-rooted plants and grasses. The Pleistocene is considered to be the period in which many annual spp. originated, and the disturbances produced by man may have been a major reason for the appearance of a great number of annual spp. Numerous spp. of grasses and Compositae are thought to have originated within the time of man.—F. W. Foxworthy.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; and: Disease as decisive factor in wars, 13248; Monozygotic vs. dizygotic twin frequencies in white and colored population, U. S., 13386; Sex ratios among single and plural births, U. S., 13387; Human population ecology, 13496; Hematological data, Punjab, 13709; Alcoholism, 13823; Chemical evaluation of nutritional state in application to public health, 13854; Dietary survey, Scotland, 13855; Basic research needs in nutrition, 13866; Deafness and other effects in children, resulting from maternal rubella in pregnancy, 14045; Male infertility, 14047; Contraception masking sterility and infertility, 14057; Incidence of urinary calculi in American Negro, 14064; Statistical study of mortality from leukemia, 14330; Wartime malnutrition in children, France, 14369; Health insurance in the U. S., 14829; Nausea among combat soldiers, 14841; World incidence of helminth parasitism, 15923)

### POPULATION, FERTILITY, VITAL STATISTICS

13464. Hinman, Frank. (*U. California Hosp., San Francisco*.) The dawn of gerontology. *Jour. Gerontol.* 1(4): 411-417. 1946.—Experts estimate that the population of the U. S. will reach a maximum in <40 more yrs., after which the total number will decline so that by the year 2000 the population will be approx. what it was in 1920. But whatever the population of the future, the remarkable lengthening of the expectancy of life in the last 30 yrs. and the certainty of a further increase in longevity in the immediate future introduce into social life a factor never before encountered. The proportion of persons 65 yrs. of age and over has increased so rapidly that in a few more decades the elders will outnumber the youth of this country. So far the social sciences have done nothing for the aged. Politicians, probably because so few of them are biologically minded, have missed the significance of the problem. Social security, by which the aged will be classed as dependents, is not the answer. They cannot rightfully be pushed out as has-beens. Those intellectual values which are called human give older people the right to work and play usefully, not just for the purpose of killing time. Aging begins at 40 or thereabouts, and from then on each individual faces the problem of adjustment to the changing social conditions of his environment. Fortunately the capacity for intellectual work does not begin to diminish till near 60. At 60 it is better than it was at 30, better at 75 than at 20, and better at 90 than at 15. Because of the progress of medicine, an age of elders unknown to history has begun, and it is high time for society to recognize its significance and to inaugurate an "old age movement" in self defense. Every healthy elder has some ability and should be given the opportunity to use it.—Frank Hinman.

13465. Tyssen, J. Rachitis als constitutis-ziekte. [Rickets as a constitutional disease.] *Maanschrift Kindergeneesk.* 11: 163-170. 1941-42.—The number of cases of blindness per 100,000 population, in western Java, according to the 1930 census, was: Infants—♂ 37; ♀ 34; older children—♂ 113, ♀ 84; i.e., a ♂ preponderance of 3 and 29, respectively. Corresponding figures for the Netherlands (census of 1920) were 4 and 7, respectively. The great increase in incidence of blindness in Java as the children become older cannot be ascribed to hereditary blindness; incidence of hereditary blindness is about the same in the 2 countries. The author observed many cases of avitaminosis A in Atjeh (Sumatra) in 1931—among nurslings, the acute, usually fatal keratomalacia, and among older children, xerophthalmia, often leading to blindness. There was no sex difference in incidence or course of the illness among nurslings, but among the older children the ♂:♀ ratio was 2:1. In infancy, the

human is only a consumer of vit. A, but later he can also produce it from the carotene in his food. A congenital functional inferiority occurring more frequently in boys than in girls (*Ascaris* may play a role in this) is the reason that more boys than girls are unable to convert provitamins into vitamins (a vitamin apraxia). As for vit. D, the suckling is likewise only a consumer, while the older child is a producer as well. The possibility that a similar distribution, and correspondingly a similar vitamin apraxia, may be one of the causes of rickets, was studied from statistics of Dutch university clinics. The following incidences of rickets are given (cases per 100,000 population): in Leiden—19 boys and 19 girls younger than 9 mos., 95 boys and 67 girls older than 9 mos.; in Groningen—8 boys and 7 girls younger than 7 mos., 49 boys and 40 girls older than 7 mos.; in Amsterdam—14 boys and 6 girls younger than 7 mos., 52 boys and 33 girls older than 7 mos.—D. A. van Dorp.

13466. Wilcox, Earley Vernon. Acres and people. 297p. Illus. Orange Judd Publ. Co., Inc.: New York, 1947. Pr. \$3.—A discussion of the population problem in India and China. The religions, social customs, political organizations, living conditions and historical background of the various people of the Far East are considered from the standpoint of their effects upon population growth and population pressure. Agric. resources and possibilities of industrialization are surveyed to determine the maximum population this region can support. The point of equilibrium between population and food is considered as conditioned by basic living standards. These standards in turn are set by such factors as religious taboos, political expts., illiteracy, disease, climate and poverty. At present the region is in a state of chronic famine.—Conway Zirkle.

13467. Anonymous. Births and deaths in 1946. *Statist. Bull. Metropolitan Life Insurance Co.* 27(12): 3-5. 1946.—Births and natural increase in the U. S. reached new, though temporary, peaks in numbers (but not in crude rates) in 1946. The rapid rise in the crude birth rate in the 2d half of the year was a consequence of the rapid demobilization of the armed forces which began soon after V-J Day. The crude death rate reached a new low in spite of the large number of births and the slowly increasing proportion of the population in the older age groups. Infant mortality also reached a new low.—P. K. Whelpion.

### BEHAVIOR—SPEECH DISORDERS

13468. Huber, Mary. (125 East 74th St., Brooklyn 2, N. Y.) Paragnosia and paraphasia. *Jour. Speech Disorders* 11(4): 321-326. 1946.—Phonetic analysis of patients with paragnosia and paraphasia produces the following conclusions:

—It seems unlikely that, for dysphasics as a group, there are actually any particular vowel sounds that consistently represent more difficulty than others; however, both pure vowels and diphthongs which represent names of letters of the alphabet, hence more meaningful symbols, may be more easily perceived and initiated by some dysphasics. Vowel sounds, presented in isolation, cause less difficulty, either in perception or initiation, than consonants. Four cases out of six experienced slightly less difficulty either in perception or initiation of surd consonants than sonant consonants when presented in isolation. Whether one-syllable words including only sonant consonants present more or less difficulty than vowels or consonants presented in isolation appears to depend upon (a) whether the receptive dysphasia is largely a difficulty of perception or comprehension, and (b) the subject's attitude as set in the testing situation. For receptive dysphasics as a group, 1- and 2-syllable words including surd consonants represent greater difficulty either in perception or initiation than one and two syllable words including only sonant consonants. Bi-labial surd and sonant consonants appear to represent less difficulty either in perception or initiation than other consonants. The phenomena of perseveration and association interference appear to complicate the problem of differentiation. Perseveration, or some disturbance related to it, appears to be one of the concomitant factors which combine to produce the symptoms of paragnosia and paraphasia. —M. F. Palmer.

13469. Masland, Mary Wootton. (*Pennsylvania Hosp. Inst. Mental Hyg., Philadelphia.*) Testing and correcting cleft palate speech. *Jour. Speech Disorders* 11(4): 309-320. 1946.—Review of work with cleft palate carried on by the Children's Memorial Hospital of Montreal, Canada, for a year and a half. A word test, designed to discover those consonants during the articulation of which nasal escape occurs, was given 25 cleft palate patients and 10 normal adults. The nasal escape of air during the performance of this test by cleft palate patients was demonstrated by the movement of a lever connected with the tambour of a pneumoscope. Efforts of patients to reduce or eliminate the nasal escape of air were consistently more successful when visual indication of success or failure was provided by the pneumoscope. Simultaneous kymographic records of air pressure changes in the mouth and nose, respectively, during articulation of the test words provided objective evidence which was used for analyzing the speech defects of the patients. Similar kymographic records were made at intervals during the course of speech training and the number of consonants during the articulation of which nasal escape of air occurred was used as a measure of progress. Four illustrative cases are presented.—M. F. Palmer.

13470. Peacher, William G. (*Valley Forge Gen. Hosp., Phoenixville, Pa.*), and William E. Harris. (*McGuire Gen. Hosp., Richmond, Va.*) Speech disorders in World War II. VIII. Stuttering. *Jour. Speech Disorders* 11(4): 303-308. 1946.—Review of such material as is available on stuttering in the armed forces. The Army was apparently justified in inducting stutterers into the armed forces. The men observed with this symptom have generally made a good adjustment and have served their country well in Combat, Communication Zones and Zone of Interior assignments. Many of these soldiers would have profited by speech training as demonstrated in this paper, if it had been practicable for the Army to provide such instruction. Should the policy of universal military duty be inaugurated in this country, it is suggested that a more adequate, standardized test service for speech defectives be organized by the Surgeon General, and that those stutterers and other speech defectives otherwise capable of military service be sent to special centers where speech correction would be provided on a systematic basis.—M. F. Palmer.

13471. Schuell, Hildred. (*Washington High Sch., South Bend, Ind.*) Sex differences in relation to stuttering. I. *Jour. Speech Disorders* 11(4): 277-298. 1946.—Review of the literature on sex differences showing the many differences which exist between the sexes physically, mentally and emotionally with the hypothesis developed that it would seem that the ♂ child, whose physical, social and language development proceeds at a slower rate than that of the ♀, encounters more unequal competition and, consequently,

more frustrations particularly in relation to language situations than a ♀ child; that as a result he exhibits more insecurity, more hesitancy, more inhibitions in speech. This hypothesis will have to be tested by more comprehensive studies than any so far made of stuttering. The insecurities, anxieties and tensions in our culture appear to be increased by the contradictory attitudes prevalent toward the ♂ child that he exhibit independence, fearlessness, self control and aggressiveness and, second, that at the same time he must be submissive, orderly and obedient, etc.—M. F. Palmer.

13472. Wood, Kenneth Scott. (*U. Oregon, Eugene.*) Parental maladjustment and functional articulatory defects in children. *Jour. Speech Disorders* 11(4): 255-275. 1946.—50 pairs of parents were selected who had children with defects of the articulatory type not assignable to low mentality, hearing loss or organic malformations. These parents were normal in intelligence, hearing and speech. The California Test of Personality and the Bernreuter Personality Inventory were given to all 100 parents and the scores compared statistically with the test norms. The speech-defective children were given the California Test of Personality and the Aspects of Personality Test (Pintner); some were given the Murray Thematic Apperception Test. Two clinical groups were established on the basis of paired neurotic tendency ratings of the mothers; and a program of parental counseling was carried on in one group in addition to treatment of the children. Results were as follows:—Maternal scores on the Bernreuter Inventory differed significantly from test norms showing that mothers of speech-defective children were more neurotic in tendency, more submissive and more self-conscious. The scores of fathers did not differ. No correlation was found between the personality-test scores of children and those of their parents. Of the group of 50 speech-defective children, 72% had at least one parent above the 60th percentile in neurotic tendency and 64% at least one above the 70th. Maternal scores on the California Test of Personality differed significantly from test norms, indicating that mothers were lower in self-adjustment. Fathers rated lower than the test norms in self-adjustment. Of the group of 50 speech-defective children, 86% had one or both parents who were below the 35th percentile in self-adjustment, and 64% had one or both parents below the 35th percentile in social adjustment. Social standards of mothers were found to be very high in comparison with other adjustment scores. The speech-defective children did not differ significantly from the test norms. As a group they seemed better adjusted than did either the mothers or the fathers. Results of the Thematic Apperception Test administered to about 25% showed a sense of frustration, withdrawing and lack of affection, anxiety-insecurity, lack of belongingness, achievement, aggressiveness, hostility and escape. Case history data obtained for the most part from the mothers revealed 13 salient factors in home environment. Most frequent factors were lack of recreational outlet, ignorance of child behavior problems, overly severe child discipline methods and defective home membership. When the mothers themselves were clinically treated for the purpose of alleviating their own problems, their children improved more rapidly than did the control group. Functional articulatory defects of children are associated with maladjustment and undesirable traits on the part of the parents.—M. F. Palmer.

#### ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

13473. Thompson, George N. (*Sch. Med., U. So. California, Los Angeles.*) A psychiatric formulation of alcoholism. *Quart. Jour. Stud. Alcohol* 7(3): 346-355. 1946.—A re-evaluation of the psychiatric aspects of alcohol addiction or habituation is presented. The cortical components of the engrams of personality are the first neurons to be affected by alcohol; under effect of alcohol the diencephalic components function with diminished cortical guidance. The drinker's attempt to "escape" from his own personality characteristics is really an attempt to ventilate these traits. Important psychiatrically distinguishable groups are "normal" drinkers seeking periodic relief from standards too high, persons with varying degrees of cyclothymic personality reaction, some with schizophrenic characteristics, those with basically psychoneurotic characteristics, and those with varying degrees of psychopathic personality. Persons with chronic cyclothymic depressions find in alcohol an opportu-

nity to escape from a depressive hypothalamus. Alcoholism may become part of the pattern of stereotyped activity of the schizophrenic. The syndrome of "alcoholic preacox" is described. Alcoholism is a welcome temporary relief to the psychoneurotic. A theory of the etiology and psychopathological mechanism of the psychopathic personality is proposed, with incapacity to apply the concept of time as the pathognomonic sign. The partial psychopath drinks to remove the last vestige of inhibition. The abnormal reaction to alcohol is the expression of psychopathy uninhibited. Periodic drinkers may be cases of this type, their "artificial psychopathic instincts" making periodic demands upon the organism. Until the alcoholic finds that life without alcohol is more satisfying than life with alcohol, he will continue to drink to intoxication.—G. N. Thompson.

13474. Zutt, J. Zur gegenwärtigen Zunahme des Morphismus. [The present increase in morphine addiction.] *Ärzt. Wochenschr.* 1: 59. 1946.—A decrease in the orderliness of life and greater availability of the drug have caused an increase in morphine addiction after this war as well as after the previous one. In comparison with the excessive use of alcohol, however, this increase is not significant in Germany. Institutional treatment for 3-6 months or more and psychotherapy seem to be the least traumatic for the patient, though a variety of withdrawal symptoms may be expected. Quite important factors in the treatment are the dissolution of personal and social conflicts, follow-up contacts, individualized treatment, and insight on the part of the patients. Case histories are given to show how supervised moderate usage need not involve decreased performance, and how withdrawal may be successful even in old age and after long abuse, provided kidney functions have remained normal.—J. Deussen (courtesy *Psychol. Absts.*).

#### MISCELLANEOUS

13475. Mellanby, Kenneth. (Sch. Hyg. Trop. Med., London, Eng.) Medical experiments on human beings in concentration camps in Nazi Germany. *Brit. Med. Jour.* 1947(4490): 148-150. 3 fig. 1947.—The fact that the expts. took place was clearly proved by the International Military Tribunal. Victims were immersed in cold water until their body temp. was reduced to 28°C when they died. Expts. were made with poison bullets, contagious diseases, sterilization of ♂ and ♀ with x-rays and the fatal effects of very high altitudes and pressure. Thousands of individuals were the involuntary victims of med. expts. and a high % died. Thousands were put to death in expts. to find quick methods. Fig. 1 is a photograph of 23 of the accused. Fig. 2 diagrams the chain of responsibility from Hitler. Fig. 3 represents the web of Karl Brandt who oc-

cupied a paramount position as Reichskommissar for health and sanitation and had direct and complete control over every medical activity. The article evaluates the facts proved by I. M. T. and revealed by Himmler's documents. He had an obsession for keeping every letter, memorandum and report, including even scraps of paper with notes on them.

13476. Tallman, Frank F. (Dept. Publ. Welfare, Columbus, Ohio.) A mental hygiene program for Ohio: A blue print for action. *Ohio State Med. Jour.* 43(1): 37-41. 1947.—Ohio was one of the first states to care for the mentally ill. The medical convention, 111 yrs. ago, recommended and the legislature made an appropriation and appointed a board to be responsible for building an institution which was built before the State Capitol. To maintain a position of pre-eminence there are pressing needs. Hospitals need 18,500 more beds for mental patients and an additional 100 physicians and 1,600 nurses and attendants to meet the requirements of present standards of therapy for the mentally defective. The program outlined includes research, prevention, treatment, personnel and buildings.

13477. Tramer, M. Zur Frage des Geburtsmonates bei schwererziehbaren Kindern. [Concerning the month of birth of problem children.] *Zeitschr. Kinderpsychiat.* 11: 11-20. 1944.—A study of 1,218 problem children under 15 gave moderate evidence that the month of birth is of etiological significance for constitutional educational difficulties; in particular a child born in July will be least likely to present such problems. The statements are offered as tentative, deserving further investigation.—R. Lassner (courtesy *Psychol. Absts.*).

13478. Anonymous. Resettlement of the disabled. Progress report. *Brit. Med. Jour.* 1947(4490): 151. 1947.—Report of the Standing Committee on the rehabilitation and resettlement of disabled persons. London: H. M. Stationery Office. Price 4d.—The no. of disabled persons registered was 628,000: surgical group 289,000, medical 196,000, psychiatric 34,000, miscellaneous 109,000, chiefly eye and ear defects. About 67 Govt. training centers are functioning in which disabled are trained side by side with able-bodied. The courses in a wide range of manual occupations last from 6-12 mos. and have now been completed by 25,000 persons. A further 3,000 have had training for professional, technical or executive positions. The Govt. has provided electric hearing devices for 19,000, artificial limbs for 3,900, cared for and provided part-time employment for 22,000 tubercular persons and is making provision for 30,000 cardiac cases. The paraplegics, in view of their limitations and need of medical supervision, are an important group but even these with modern methods of treatment are able to undertake remunerative employment under suitable conditions.

#### ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Zooanthellae as responsible for phototropism, 13519; Correlation between gill surface and activity in marine fishes, 13772; Behavior in relation to O<sub>2</sub> consumption in goldfish, 13777; of monkeys following removal of prefrontal lobes, sedatives as affecting, 14087; of sea-star (Pteraster), 16023; Preferences of rats for alcoholized food, 13874; Conditioned reflex affecting lactation, rats, 14058; The effect of di-isopropyl fluorophosphate on behavior in *Amblystoma*, 14146; Detection of toxic gases by trained dogs, 14217; Changes in activity of rats in relation to obesity, 14373; Activity of normal dogs during excitement, 14380; of sheep tick, 15817; of sheep tick on various hosts, 15820; Attraction of mosquito to man, 15972; Grasshopper sounds, 16135; Mating in terns, 16178; Polygamy in birds, 16181, 16204, 16206)

13479. Anschau, M. Über das Verhalten der Larven von *Hydrobius fuscipes* bei der Nahrungsaufnahme. [Behavior of larvae of *H. fuscipes* in food-taking.] *Oesterreich. Zool. Zeitschr.* 1(1/2): 165-169. 2 fig. 1946.—In taking food on a dry surface the larva of the water beetle *H. fuscipes* creeps with a leech-like movement of the abdomen, after-dragging the head charged with prey. When startled, the larva drops its prey and quickly creeps into the water. During feeding the larva can fasten itself by adhesion even to very smooth vertical surfaces such as aquarium walls. In contrast, primary larvae of *Helochares* typically take food while lying on *Lemna* leaves with only the head stretched above water.—Max Onno.

13480. Dijkgraaf, Sven. (U. Groningen, Holland.) Die Sinneswelt der Fledermäuse. *Experientia.* 2(11): 438-448. 8 fig. 1946.—Studies on the sense perceptions of the bat (*Myotis emarginatus*). Since the eyesight of bats is poor it

has been generally believed that they are guided in their flights by a sense of touch. It is now known that audition enables bats to avoid obstacles. They emit supersonic cries which are reflected from objects by "echolocation". The supersonic cry has a frequency as high as 50,000 vibrations per sec., which to the human ear is only a faint click. Minute structures, even threads 1 mm. in diam., are detected and located. The maximum distance for such perception seems to be <50 cm. Bats have also a homing sense and can return after transportation over 100 km. In familiar places a proprioceptive muscle sense and place memory appear to play a part. The expts. made to prove that obstacle perception is a function of the ear are described and illustrated.

13481. Feuerborn, H. J. Der Instinkt-begriff und die Archetypen C. G. Jungs. Ein Beitrag zur Synthese zwischen Tierpsychologie und Psychologie des Menschen. [The notion of instinct and C. G. Jung's Archetypes. A contribution to



synthesis between animal and human psychology.] *Biol. Gen.* [Vienna] 14: 456-506. 1939.—The author disagrees with the "Archetype" theory of Jung and of Alverdes, and inclines toward a mechanistic point of view in that physiological bases may be postulated for all psychological phenomena. In the author's opinion a synthesis is possible for human and animal psychology, provided that relationships are studied in terms of large-scale analysis—a study not only of "psychological" aspects of problems but also one utilizing methods and results from all domains of biology.—*Max Onno.*

13482. Frisch, K. v. Die Tänze der Bienen. [Dances of bees.] *Oesterreich. Zool. Zeitschr.* [Vienna] 1(1/2): 1-48. 16 fig. 1946.—The "round dance" (Rundtanz) of the honeybee occurs on the return of finder bees from sources less than 50-100 m. from the hive; while the "tail-wagging dance" (Schwänzeltanz) typically occurs upon return from more distant sources. Under equivalent conditions, i.e., with return from the respective corresponding distances, sugar-water and pollen-collectors behave equivalently in that the same type of dance can occur in both instances. The number of turns in the tail-wagging dance decreases inversely with the distance, so that it is possible to estimate the distance of the source by timing the dance. The tail-wagging dance may serve to orient aroused hivemates in the general direction of the food source, in dependence upon the direction of the finder's tail-wagging run in the hive.—*Max Onno.*

13483. Koenig, Otto. Verstandesleistungen bei Scheibenbärschen. [Performances of intellect in Mesogonistius caetodon.] *Umwelt* 1(1): 22. 1946.—The N. American fish *M. caetodon*, which feeds on fish eggs, was kept in the same tank in the Berlin aquarium with the S. American *Corydoras paleatus*. In the course of time *Mesogonistius* developed a conditioning of its egg-feeding response both to the peculiar copulatory posture and to the spawn-containing fin pouch of *Corydoras*.—*Max Onno.*

13484. Licklider, J. C. R., and M. E. Bunch. Effects of enforced wakefulness upon the growth and the maze-learning performance of white rats. *Jour. Comp. Psychol.* 39(6): 339-350. 1946.—An exptl. group of 48 animals, ♂♂ and ♀♀, were kept awake for 20 hrs. a day on a treadmill surrounded by water. Three control groups were used: (a) animals living in cells identical with those of the exptl. group except that the treadmills were kept stationary ( $n = 21$ ); (b), as in (a) except that the animals were forced to exercise as much in  $1\frac{2}{3}$  hrs. as the exptl. animals did in 20 hrs. ( $n = 23$ ); (c) a laboratory group living in regular laboratory cages ( $n = 55$ ). (All  $n$ 's refer to survivors, since some animals in each group died during the course of the exptl.) The animals were set to the exptl. (or control) regime at 30 days of age; and 20 days later training was initiated on a water maze, other exptl. conditions remaining unchanged. The growth curves of the 3 control groups are similar and apparently normal for both ♂♂ and ♀♀. Those of the exptl. group, however, rise much less rapidly than those of the control groups from age 30 days on, and at about 72 days become nearly flat. With respect to learning performance in the water maze, the wakeful animals were superior to all other control groups on all criteria: trials to learn, errors, distance traveled, time, and speed. The wakeful animals became highly irritable during the course of the exptl. They were less able to withstand a further 24-hrs. of enforced wakefulness than were the controls.—*R. F. Jarrett.*

13485. Maier, N. R. F., and R. S. Feldman. (U. Michigan, Ann Arbor.) Studies of abnormal behavior in the rat. XIV. Water spray as a means of inducing seizures. *Jour. Comp. Psychol.* 39(5): 275-286. 1946.—57 litter-mates, 106-351 days of age at the outset, were divided into control and exptl. groups. The animals of the exptl. groups were subjected one at a time to a high-velocity stream of water. The control animals in an adjacent cage were splashed, but did not receive the direct force of the stream. A larger proportion of the exptl. than of the control animals had convulsions in the water situation. Post exptl. tests revealed essentially identical proportions of control and exptl. groups had seizures in a key-jingling or air-hiss situation.—*R. F. Jarrett.*

13486. Riess, Bernard F. (Hunter Coll., N. Y.) "Freezing" behavior in rats and its social causation. *Jour. Soc.*

*Psychol.* 24(2): 249-251. 1946.—"Freezing" refers to the animal's (rat or guinea pig) refusal to become active in a learning situation. The animal simply sits at a point and remains there. "Freezing" was found to occur largely among animals housed in groups, seldom among those caged alone. Of 18 animals who showed this response, 15 were consistently the submissive rats in their respective cages. In no instance did more than one rat in a cage exhibit freezing.—*C. W. Telford.*

13487. Russell, Andrew G. A. Can animals think? *Nat. Hist.* [New York] 55(10): 478-480, 490-492. 2 fig. 1946.—The author reports numerous observations of mammals on his ranch and in the high Rockies of the Northwest which are offered as evidence for thinking. One coyote stood in the shadow of a bull elk where he could see and catch mice that were routed out by the elk's pawing to grass through a 14-inch layer of snow. Bighorn sheep became alarmed when 5 hunters went behind a rock and only 3 remained in sight on a nearby ridge.—*G. H. Kelker.*

13488. Schneirla, T. C. (Amer. Mus. Nat. Hist., N. Y. C.) A study of army-ant life and behavior under dry-season conditions with special reference to reproductive functions. 1. Southern Mexico. *Amer. Mus. Novitates* 1336. 1-20. Map. 1947.—Field studies of various spp. of army ants (Dorylinae: *Eciton*) were carried out in 5 well-separated rain-forest areas of southern Mexico, in the dry season of 1945. Correlated studies were made of colony behavior (e.g., pattern of raiding and nomadism) and of internal conditions in the colonies with particular reference to the condition of the brood or broods and queen. The survey was cross sectional, in that each of >20 colonies was observed for a limited period of a few days before its brood and queen were captured for preservation. The object was to test the author's theory of the army-ant behavior system under new (dry-season) conditions and in new localities. The findings indicate that Mexican spp. of *Eciton s. str.* maintain in the dry season essentially the same pattern of periodic shifts in behavior (the "nomad-statory cycle") previously reported for Panama spp. under rainy-season conditions, with certain secondary differences. Here also, the basis of the cyclic behavior changes (as records of brood-production indicate) rests in the capacity of the colony queen to produce immense batches of eggs at distinct intervals. Limited evidence suggests that ♂ broods appear in the dry season, at some point in the cycle of a given colony, with worker broods otherwise predominating. The general mechanism of army-ant adaptation to dry-season conditions is discussed.—*T. C. Schneirla.*

13489. Scow, R. O. The retarding effect of allyl thiourea and of partial thyroidectomy at birth upon learning in the rat. *Jour. Comp. Psychol.* 39(6): 359-370. 1946.—Learning was retarded in normal male rats of two different age groups (190 and 375 days old) through daily injns. of 20-25 mg. of the thyroid-depressant drug, allyl thiourea. The injd. rats made more daily errors, but did not require significantly longer time to make the daily run. Learning was impaired in rats which had been partially thyroidectomized at birth. These hypothyroid rats also made a greater number of daily errors but required no longer to run through the maze. A multiple-discrimination (visual) problem was used, and the motivation employed was escape from cold (9-15°C) water through which the animals were forced to run.—*R. F. Jarrett.*

13490. Sharp, H. C., C. L. Winder, and C. P. Stone. Effects of electro-convulsive shocks on "reasoning" ability in albino rats. *Jour. Psychol.* 22: 193-197. 1946.—Evidence based on data from six adult rats indicates that electro-convulsive shocks alter and impair the performance of rats in the Maier "reasoning" test. The amt. of disturbance appears to be inversely related to the length of the period of recovery after individual shocks. Suggestions have been given for further investigations which may shed considerable light on the influence of convulsive shocks on cognitive functions in infra-human subjects.—*R. B. Ammons (courtesy Psychol. Absts.).*

13491. Siegel, Paul S., and O. L. Lacey. (U. Alabama, University.) A further observation of electrically-induced "audiogenic" seizures in the rat. *Jour. Comp. Psychol.* 39(6): 319-320. 1946.—Two animals were observed in convulsive seizures very similar to those reported by Maier,

the so-called "audiogenic" seizures of Morgan and others, when current from a 60-cycle, 80-v. source was applied through the ears.—*R. F. Jarrett.*

13492. Trumler, E. Die Psyche der Einzeller. [Psyche of unicellular organisms.] *Umwelt* 1(1): 10-13. 2 fig. 1946.—The activities of unicellular organisms are interpreted as "psychical expressions," i.e., as products of self-preservation and species-survival instincts and as a searching after optimal life conditions.—*Max Onno.*

13493. Trumler, E. Eine Ameisenbeobachtung. [An ant observation.] *Umwelt* 1(1): 15. 1946.—In a discussion of certain observations on *Formica rufa* by E. Löffler, the ob-

server's explanatory concept of "intelligence" is considered less warranted than an interpretation of the events as complex instinctive performances.—*Max Onno.*

13494. Trumler, I., und E. Trumler. Kampf zwischen Waldsandläuferlarve und Ameise. [Struggle between larva of Tiger beetle and ant.] *Umwelt* 1(1): 14-15. 1 fig. 1946.—A larva of *Cicindela sylvicola*, a beetle species common in the Wienerwald, was successfully attacked by a *Formica fusca* worker which might have served as its food, and killed by a 2d *fusca* worker. This turn of events is attributed to the helplessness of the larva when outside its dwelling tube.—*Max Onno.*

# ECOLOGY

Editors

ORLANDO PARK, *General Animal Ecology*  
G. D. FULLER, *General Plant Ecology*  
G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*  
L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL AND ANIMAL ECOLOGY]—Adaptation of the army ant to dry conditions, 13488; Barnacle communities, Palao, 13545; Biota of boom piles, 13559; of sewage purification, 14811; Intracellular symbionts of cockroach, 14550; Insect pollination of guayule, 15451; Microfauna of forest soils, 15489; Hymenoptera parasitic on gypsy moth, 15807; Sheep tick (*Ixodes ricinus*), 15817, 15820, 15821; Anopheles, 15980; Pycnogonida, 16067; Spiders of Alaska, 16068; Opiliones of Finland, 16072; Tardigrada, 16074; Scorpions of S. Amer., 16075; Coleoptera of Morocco, 16080, 16081, 16086, 16096; of France, 16090; Simuliidae of Venezuela, 16107; Diptera of Guam, 16109; of N. Amer., 16110; Hymenoptera of S. America, 16112; of Chile, 16113; Army-ant life, 16115; Lepidoptera of Washington, 16127; Neuroptera of Central America, 16128; Plecoptera of Canada, 16129; Orthoptera of Norway, 16133; Mexican lizards, 16171; Lizards of N. America, 16172; Snakes of E. Africa, 16175; of Brazil, 16177; Birds of French Congo, 16179; Ecological counterparts in birds, 16190; Sea lion, 16230. [PLANT ECOLOGY]—Early relations of man to vegetation, 13463; Dust storms in Egypt, 13508; Soil microflora in the Sahara, 14885; Algae as ecologic indicators in paleobotany, 14987; Ecology of carboniferous floras, 15033; Veronica praecox, 15190; Dipterocarps of Malaya, 15193; Adventives in Swedish parks, 15215; Vegetation of Mexico, 15219; Phytogeography of African floral elements in Europe, 15225; Root development as related to soil conditions, 15317; Guayule, 15453; Douglas fir in Denmark, 15482; Eelgrass revival in New England, 15736).

## GENERAL

13495. Fautin, Reed W. Biotic communities of the northern desert shrub biome in western Utah. *Ecol. Monogr.* 16(4): 251-310. 19 fig. 1946.—The sagebrush community occurs along the windward bases of mts. or in valleys where the precipitation is greater and/or where the soil is deep, more permeable, and relatively saline-free; the shadscale and its closely related communities occupy the more xeric areas where the soil is often heavily impregnated with mineral salts. Temp. conditions are similar in both associations, ranging from a max. of 115°F to a min. of -28°F with an annual mean of 49.9°F in the sagebrush areas as compared with a max. of 110°F to a min. of -30°F, with an annual mean of 49.5°F in the shadscale areas. Average annual precipitation in the sagebrush areas was 14.84 inches, as compared with 7.95 inches in the shadscale areas. The shadscale, tetradymia, greasewood and sagebrush communities were studied most intensively and are described in greatest detail. The plants and invertebrates are regarded as constituting the biotic matrix of the various communities. The relationships of the vertebrates to the biotic matrix, together with their interactions and environmental responses, are described as far as they are understood. Invertebrates were consistently most abundant in the sagebrush and greasewood communities. Max. populations occurred during May in all communities except the greasewood, after which they declined as the summer temps. increased. Most of the major influent mammals, such as the badger, coyote, and antelope ranged throughout all communities. The coyote was the most ecologically important major influent in all communities and was most abundant in the greasewood and sagebrush communities where there was the greatest amt. of cover and where its basic food supply (rabbits) was most abundant. The major influent birds also ranged throughout all communities. The most important spp. included the Swainson hawk, marsh hawk, prairie falcon, and burrowing owl. The smaller vertebrates were much more numerous and although many of them occurred in all the biotic communities they varied in abundance from one community to another. Heteromyidae, consisting of 3 spp. of pocket mice, 2 of kangaroo rats, and one kangaroo mouse were prevalent throughout all communities. *Dipodomys microps* was most abundant in the shadscale and tetradymia communities where it constituted 80.6 and 60.9%, respectively, of the total rodent population. *D. ordii* occurred in all communities except the black sage and was more abundant than *D. microps* in the greasewood and sagebrush communities. Jack rabbits were widespread but were most abundant in the sagebrush and greasewood communities. Passerine bird populations were low and resident spp. few in number. 61 spp. were observed of which the desert horned lark, black-throated desert sparrow, sage sparrow, and the rock wren were the most common nesting spp. within White Valley. Average summer bird populations varied from 10.6 per 10 hectares (25 acres) in the shad-

scale and 12.6 in the tetradymia to 27 in the greasewood community. The reptiles were represented by 6 spp. of lizards and 4 spp. of snakes. The brown-shouldered uta was not only the most abundant lizard but it had the longest daily and seasonal periods of activity and occurred in all communities, being most abundant in the tetradymia community during Apr. and May. Soil texture seemed to be a very important factor concerned with the distribution of many of the biotic components. Its apparent effect on the distribution of certain rodents and reptiles is described. The height, density, and vegetative form of the dominant plants also influences the composition of many of the biotic communities. Dominants of the greasewood and sagebrush communities are very similar in vegetative form, height and density, and many of the animal components were more nearly alike, although the communities studied were >100 miles apart, than were the components of the greasewood and shadscale communities which were adjacent to each other in White Valley. Morphological adaptations of the plants in response to the xeric climatic conditions were very pronounced. The dominants are all perennials, are widely spaced, and have shallow fibrous root systems which are supplemented by a long taproot in some spp. Conservation of water is accomplished through morphological adaptations such as reduced leaf surfaces, heavy cutinization of the epidermis, extreme pubescence of the leaf surfaces, and defoliation during the dry summer season. Most of the animals are characterized by morphological and physiological adaptations or by adaptive types of behavior which enables them to tolerate or evade the high temperatures, low humidity, and scarcity of drinking water.—R. W. Fautin.

13496. Prát, S. M-concentrace jako obecně biologický problém. [The M-concentration as a general biological problem.] *Sbor. České akad. Zem.* 18: 7p. 1944.—Bail's M-concentration (the maximum conc. of organisms in a given space) is not only a bacteriological but also a general biological characteristic. In agriculture it is an important factor in spacing. The M-conc. applies also to man, as demonstrated by the efforts of modern urbanism to diminish the accumulation of people in towns.—S. Prát.

13497. Silveira, Verlande Duarte. Flora microbiana do ar atmosférico. [Microbial flora of the atmospheric air.] *Bol. Soc. Brasileira Agron.* 9(1): 9-54. 10 pl., 12 fig. 1946.—Bacteria, molds and yeasts, usually in the form of spores, are the principal components of the flora of the air. Methods of collecting or sampling this flora are discussed, with descriptions of the equipment used. Keys for the determination of bacteria, following Bergey, and of the yeasts, adapted from Guillermond, are included; as is also key to the mold fungi, containing the spp. most commonly encountered in air analyses at Rio de Janeiro.—J. L. Cardledge.



BIQCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Climate and plant breeding, 13334; and subsoil formation, W. Virginia, 15313; and guayule culture, 15446, 15447, 15452; Air conditioner, 13412; The month of birth of problem children, 13477; Relation of temp. to O<sub>2</sub> consumption in goldfish, 13769; Time of day in relation to metabolic rate in mice, 13770; Temp. in relation to metabolic rate in phenol injd. mice, 13771; Heat tolerance of Jersey cows, 14488; Weather and egg production, domestic fowl, 14521; Protein requirement of hens in hot weather, 14523; Freezing injury to raspberries, 15359, 15360; Climatic factors determining high yield of potatoes, 15396; Frost during foliation as affecting morph. and physiology of beech leaves, 15588; Weather as affecting honeydew production by aphid, 15811)

13498. Adolph, E. F. (U. Rochester, N. Y.) Tolerance of man toward hot atmospheres. *Publ. Health Repts. Suppl.* 192. 1-38. 28 fig. 1946.—Available data were analyzed to establish the limiting atmospheric conditions in which men survive. Intolerance for heat is signalled by premonition of collapse or heat exhaustion, which is a circulatory inadequacy. Even in atmospheres of less stress, significant physiol. strains have been measured. Wet-bulb temps. above 90°F can rarely be endured indefinitely; this limit includes dry-bulb temps. up to 140°F. During work the intolerable wet-bulb temps. may be 80°F or less. Initial acclimatization to heat is acquired in the majority of individuals by 4 exposures of 2 hrs. each to a near-limiting temp. Variability among individuals is sufficient to make worthwhile the selection of persons for work in hot situations. Factors known to help men to endure high temps. are: shade, low humidity, optimal wind, minimal clothing, minimal work, acclimatization to heat, ingestion of plenty of water and salt, high physical fitness, and adequate sleep. Quantitative data upon the effect of each factor are given.—E. F. Adolph.

13499. Arcoleo, F. The problem of compulsory hail insurance. *Month. Bull. Agric. Sci. and Pract.* 37(3/4): 33E-56E. 1946.—The laws of Bulgaria, Switzerland, Yugoslavia, U.S.S.R., U.S.A. and Canada regarding compulsory hail insurance are stated. Arguments for and against it are given. Hail insurance has not made progress because of lack of foresight. Where hail is frequent, or delicate or high-priced crops are grown, premiums are excessive. General compulsory insurance would provide protection at the expense of favored regions or the general public, and would increase losses since farmers would grow more valuable crops in regions subject to hail and not hasten to harvest them to avoid damage. Government inspectors, arbitrary assessments and forms to be filled in would arouse resentment. Government assistance to those damaged by hail is a bonus to the uninsured. If all had to pay premiums the cost to each would be light.—R. O. Earl.

13500. Aycock, W. L., G. E. Foley, and K. H. Hendrie. (Harvard Med. Sch., Boston, Mass.) The epidemiologic significance of amplitudes of seasonal fluctuations in infectious diseases. *Amer. Jour. Med. Sci.* 211(8): 709-717. 1946.—Three distinct patterns of amplitude of seasonal variation are found in a number of infectious diseases. In upper respiratory bacterial infections as a group, the amplitude suggests the operation of a single arithmetic variable consistent with seasonal variation in susceptibility. In a 2d group, comprising diseases transmitted by intermediary means, the amplitudes are consistent with seasonal variation in the virus reservoir. In a 3d group, comprising upper respiratory virus infections, the amplitudes lead to the inference that both seasonal fluctuation in susceptibility and in the human virus reservoir are determinants.—Auth. concl.

13501. Bowerman, W. G. (51 Madison Ave., N. Y. C.) Acute anterior poliomyelitis: A statistical survey of the influence of weather on its incidence. *Arch. Pediatrics* 62 (2): 57-77. 1945.—The no. of cases and deaths from poliomyelitis in New York City during the period 1907 through the first 35 wks of 1944 (excluding 1908-1914) are tabulated. In those yrs. when either the no. of cases exceeded 1000 or the no. of deaths exceeded 100, the author found (1) that with one exception the summers tended to be dry or warm or both as judged by the deviation from normal of temp. and

rainfall for July, Aug., and Sept., and (2) that when the selected yrs. were ranked as to relative severity based either on no. of cases or deaths and as to either summer warmth or dryness, the closest association appeared between no. of cases and summer dryness. For these same yrs. the case fatality rate (C.F.R.) was calculated and the values were compared with the Wolfer no. of sunspots for that period. Each of the 3 sunspot maxima and 3 minima were associated with turning points in the C.F.R. curve: in the same yr. 4 times; in adjacent yrs. 2 times. In addition, 3 minor maxima and minima in C.F.R. curve were not associated with any change in no. of sunspots. A correlation of 0.37 was found between the sunspot curve and the C.F.R. curve smoothed by the Henderson Mechano-Graphic Method. The C.F.R. about sunspot maxima was 1.86 times that about minima in spite of the fact that weather at the former tends to be cool and wet and at the latter warm and dry. There are also comments on the age, sex and geographical distribution of poliomyelitis.—Frederick Sargent.

13502. Bowerman, W. G. (51 Madison Ave., N. Y. C.) Cerebrospinal meningitis and sunspots. *Arch. Pediatrics* 63(10): 504-508. 1946.—The mean number of deaths in New York City from cerebrospinal meningitis is compared with the daily mean number of sunspots (Wolf and Wolfer) over the period 1866 to 1945, incl. During this 80-yr. period there were 7 sunspot crests and 7 peaks in deaths from meningitis. The differences in yrs. between the crests were compared and in 3 cases the agreement was exact whereas in 4 cases the timing differed by 1 or 2 yrs. The av. no. of deaths about the sunspot maxima was over twice that about the minima. Similar data from Mass. from 1872 and for the entire U.S. from 1900 showed, for 7 peaks of deaths and sunspots, agreement within a yr. in all but 1 case.—Frederick Sargent.

13503. Davidson, W. F. (Consolidated Edison Co., N. Y. C.) The measurement of atmospheric pollution. *Bull. Amer. Meteorol. Soc.* 27(9): 547-549. 1946.—A plea is made of more carefully planned surveys of atmospheric pollution. Some of the criteria necessary for the collection of accurate data are briefly discussed.—Frederick Sargent.

13504. Ives, Ronald L. (Indiana U., Bloomington, Ind.) Field temperature recorders. *Bull. Amer. Meteorol. Soc.* 27(8): 444-448. 4 fig. 1946.—The design, operation, and maintenance of a field temp. recorder embodying a photoelectric recorder of commercial design as adapted for recording temp. functions under field conditions are discussed.—Frederick Sargent.

13505. Ives, Ronald L. Indiana U., Bloomington Ind. Wick-fed aspirated psychrometers. *Bull. Amer. Meteorol. Soc.* 27(8): 465-467. 3 fig. 1946.—The design, operation, and maintenance of a rugged, continuous-service psychrometer suitable for use in the field are discussed.—Frederick Sargent.

13506. Lönnqvist, O. A frost prediction diagram. *Arkiv. Mat. Astron. och Fysik* 32A(Pt. 4, paper no. 13) 1-7. 1946.—Brunt's formula to predict night minimum temp. from sunset temperature, duration of night, nocturnal radiation and a factor based on nature of surface, with radiation depending on cloudiness and water vapor content of air, was used by Dufour to construct series of tables for normal and wet ground with different lengths of night. Diagrams now given to obtain fall of temp. At for any sunset temp., any relative humidity, any night duration and with normal or wet ground, and for clear, overcast or partly clouded nights. Diagrams tested over 538 cloudless cases at Tiflis and accurate predictions ranged from 100% in summer to 68% in winter within known conditions. Diagrams can be used for fog prediction where use is made of Petterssen's diagram giving cooling required to produce fog when air temp. and humidity are known.—R. S. R. (courtesy Phys. Abst.).

13507. MacConnell, R. J. (U. S. Weather Bur., Pittsburgh, Pa.) Snow melt and its effect of flood runoff of the Ohio River at Pittsburgh, Pa. *Bull. Amer. Meteorol. Soc.* 27(8): 449-454. 1946.—The investigation was based on a detailed analysis of the snow accumulation in the Ohio River basin above Pittsburgh during the 1944-'45 winter season and on comparative studies of snow accumulation during the 1909-'10 and 1935-'36 winter seasons. The author concludes that snow melt is a factor of flood runoff in the Pittsburgh

district which points to the importance of knowing all factors in the hydrologic cycle if the accuracy and timing of forecasts of flood crests for headwater areas are to be improved. Although it is not a primary factor, lack of knowledge concerning snow melt is a definite handicap to the forecaster, as the accurate estimate of snow melt goes a long way toward bringing the forecast within a two- or three-foot range. Having accurate reports of all hydrologic factors, places the forecaster on his mettle and leaves little room for ability. Snow melt is a factor in many winter floods in the Pittsburgh District but without heavy rainfall major floods have not occurred.—*Frederick Sargent.*

13508. Oliver, F. W. Dust storms in Egypt and their relation to the war period, as noted in Maryut, 1939-45. *Geogr. Jour.* 106(1/2): 26-49. 1945.—The frequency and severity of desert dust storms were observed at Burg el 'Arab, 3 1/2 miles inland from the Mediterranean shore line midway between Alexandria and El 'Alamein. This narrow semi-desert zone of moderate but erratic winter rainfall, intensely cultivated 2000 yrs. ago, is agriculturally unimportant. The land surface was subjected to mechanical disturbances incidental to military operations which culminated in the Battle of El 'Alamein (Oct.-Nov., 1942); a period of relative quiescence ensued. From an average of 3-4 dust storms per yr. the no. increased to 8 in 1939-40 (vegetation year Oct.-Sept.), 40 in 1940-41, 51 in 1941-42. Tank and truck travel, laying of mine-fields, making of airfields and roadways, influx of war-displaced Bedouins and their flocks, and sub-normal rainfall of only 4 in./yr. combined to strip the perennial scrub cover, mainly *Thymelaea hirsuta*, and to pulverize the soil. Reserves of loose dust were thus immensely increased. 2 methods of estimating dust storm severity were used: weighing the dust which collected on unit area of a horizontal hard surface in a calm room during 1 hr., and counting the dust grains which fell in a circle of 1 mm. radius under low power (80x) of a microscope in a calm room. Maximum rate was 1/2 ton/acre/hr., while a more frequent rate was 1/8 to 1/4 ton/acre/hr. Horizontal visibility from a point 18 ft. above ground level was also used as a criterion of severity. Critical wind velocity was about 12 miles/hr. when the dust reservoir was relatively unlimited, but was much higher as the reservoir dissipated after 1942. Higher rainfall in winter 1942-43 (6.5 in.) produced good cover which inhibited dust storms. Seedlings germinating in early Jan. covered half of surface by Feb. and 3/4 of surface by the end of March. Dominants in this display of prostrate or trailing annuals were 3 spp. of Cruciferae; *Carrichtera annua*, *Enarthrocarpus lyratus*, and *Matthiola humilis*; associated were a composite *Centaurea glomerata* and a fenugreek *Trigonella stellata*. Light rainfall (4 in.) in winter 1943-44 resulted in sparse annual cover and a marked incidence of dust storms. Heavy rainfall (9.7 in.) in winter 1944-45 caused complete plant cover during the Khamsin season (March-May). Dust storms fell to nearly pre-war status. Gradual depletion of the war-caused dust reservoir and a slow hardening of the soil surface contributed to this trend, and subdued the intensity to a "sub-dust-storm" type. Perennial desert scrub cover showed continued rejuvenation after 1943, in which vigorous young plants of *Thymelaea hirsuta* dominated.—*J. C. Bryant.*

13509. Petersen, W. F. The organic state in the problem of allergy. *Ann. Allergy* 3(5): 348-359. 1945.—A discussion of how the seasonal and daily changes in the organic state of the tissues may alter the reaction of those tissues to allergens is presented. It is suggested that these variations in the organic state are conditioned by environmental impacts—trauma, work, emotion, endocrine imbalance, and especially the state of the atmosphere. Brief meteoropathologic analyses of 2 cases of coronary thrombosis and 7 cases of homologous serum jaundice illustrate the thesis.—*Frederick Sargent.*

13510. Petersen, W. F. Drug sensitization on a non-specific basis. *Ann. Allergy* 4(1): 43-55. 1946.—The relation of the daily biologic pendulation of the tissues—conditioned principally by weather changes—to drug sensitization is discussed. The biologic changes caused by the weather which are important in intoxication are (1) shifts in the distribution of blood to the tissues and (2) shifts in the acid-base balance. The first will in part determine the organic seat of the intoxication. The second will in part determine the

time of onset of the intoxication, for, when relatively acid, the tissues are fatigued, the membranes are permeable, catabolism is increased, and tissue turgor is lessened. At such times the chances of intoxication are greatly enhanced. Brief meteoropathologic analyses of several cases of drug intoxication taken from the literature illustrate the thesis.—*Frederick Sargent.*

13511. Setzer, J. A new formula for precipitation effectiveness. *Geogr. Rev.* 36(2): 247-263. 11 fig. 1946.—While investigating soil genesis in São Paulo, Brazil, the author mapped certain climatic elements of this and neighboring regions. The maps provided a clue to differences in the physical and chem. properties of the soils originating from similar rocks under different climates and also guided the development of certain ideas on the negative or positive effects of climatic factors on various important crops grown on the principal soil types of the State. From the data of 110 meteorological stations, the author prepd. annual and seasonal rainfall maps, maps for the rainiest and least rainy months, and similar ones dealing with mean temps. In compiling them, interpolations were necessary and pedologic conditions were also taken into consideration. Besides these and other climatic maps, maps of São Paulo were drawn in accordance with Köppen's international classification, Serebrenick's Brazilian classification, and Thornthwaite's classification based on temp. efficiency and precipitation effectiveness. Use of the last suggested the possibility of deducing a new formula for precipitation effectiveness, based on the well-known law of Van't Hoff. The author believes that the empirically derived geometrical progression here presented and discussed gives a more rational climatic classification. "Whatever the progression employed, it must be empirically obtained; for the influences of humidity and temperature bear on so many interacting phenomena that the possibility of simple mathematical elaboration is virtually precluded. The question is that of the influence of those climatic factors over a large and complex combination of phenomena and their interactions, so that only an empirical treatment can be satisfactory. The bases, however, can be established by a well-known general chemical law."—*Courtesy Expt. Sta. Rec.*

13512. Visher, Stephen S. (Indiana U., Bloomington.) Average daily temperature range in the United States. *Bull. Amer. Meteorol. Soc.* 27(10): 594-597. 3 maps. 1946.—Based on data from "Average daily maximum temperatures in the United States" and "Average daily minimum temperatures in the United States" (U. S. Weather Bur., Wash., 1944), 5 maps were prepd. showing the av. daily range (1) during wk. which normally is the coldest of the yr. (Jan. 15-21), (2) during wk. which normally is the warmest (July 16-22), (3) during wk. of spring equinox (March 19-25), (4) during wk. of autumnal equinox (Sept. 17-23), and (5) between wks. of other 4 maps showing the least and the greatest range; i.e., a map showing the av. annual variation of av. daily range (by wks.). Maps 1, 2, and 5 are included in the paper. In general, the maps show that the range decreases near, and especially to the leeward, of large bodies of water; that the range increases with aridity and altitude; and that the range tends to increase with the amt. of sunshine. The annual map shows greatest variability in Idaho, Washington, and Oregon (20.2°, 19.3°, and 17.7°F) and the least variability in Maine, on the Gulf Coast of Texas, and in Rhode Island (2°, 1.7°, and 0.9°F). Detailed comments on each map are given.—*Frederick Sargent.*

13513. Wentworth, C. K. Geographic variation in annual rainfall in Oahu. *Univ. Hawaii Res. Publ.* 22. 1-14. 4 fig. 1946.—Variations of interstation annual rainfall ratios from the mean were detd. over 35 yrs. for all the pairs of stations included in 13 stations—or 78 pairs and 2,730 ratios. Extreme ratios ran as high as 3 indicating that a given station in relation to another may receive as much as 3 times—or as little as 1/3 of—the expected amt. For the best-correlated pairs, the most probable deviation was <10%; for the least well correlated, it was near 45%. In the majority of station pairs, plotting on log-probability paper revealed a close adherence to the normal curve, with no systematic evidence of skewing; the few pairs deviating from this pattern are believed to be inclusive of any generic natural tendency. The closest correlation existed between stations fairly close together, so as to be influenced by unit storms of a few miles in diam. and similarly located with reference to windward or

leeward slopes, high or low elevations, and other topographic conditions. Given a station not over 5 to 10 miles away and similarly situated, the probable rainfall at a new or lapsed station can be estimated from a valid interstation ratio with a probable deviation of not over about 20%. Only the very high rainfall stations (like Luakaha) have probable deviations annually from their own mean which are smaller than this. All the others, with rainfall < about 100 in. annually, have large enough annual variations so that reference to other stations and use of interstation ratios result in an improved estimate.—*Courtesy Expt. Sta. Rec.*

## ANIMAL

13514. Abe, N. Ecological observations on *Melaphe* (*Littorinopsis*) *scabra* (Linnaeus) inhabiting the Mangrove-tree. *Palao Trop. Biol. Sta. Stud.* 2(3): 391-435. 17 fig. 1942.—A detailed study of this common snail.—*E. D. Merrill.*

13515. Baker, Rollin H. (*U. Kansas, Lawrence.*) A study of rodent populations on Guam, Mariana Islands. *Ecol. Monogr.* 16(4): 393-408. 9 fig. 1946.—Rodent populations on Guam were studied as a project of U. S. Nav. Med. Res. Unit No. 2. Individuals of 3 spp., *Rattus mindanensis*, *R. exulans*, and *Mus musculus*, were captured, toe-marked, and liberated at a quadrat, 3.1 acres in size, in 4 periods (9-14 days in duration) from May to Oct., 1945. In a 5th period (6 days), snap traps were utilized in an effort to capture most of the population. The folding Sherman live trap, size 3 × 3 × 9 in., was employed. Live trapping indicated a density of between 12 and 19 animals per acre, including about 7 *R. mindanensis*, 3 *R. exulans*, and 6 *M. musculus*. The snap trapping brought a catch of 28 animals per acre, the 3 spp. being taken in equal numbers. 40% of 150 marked and liberated animals were recaptured in 2 or more trapping periods. Results indicate that rodents at the study quadrat lived in ranges of <1 acre in area but that many individuals did not remain within the area for a very long time, since about 70% of the trapped population for each subsequent trapping period was new. Information regarding habitat preferences, density, home sites, age classes, body wts., body temps., relationships to other animals, and other data are presented.—*R. H. Baker.*

13516. Edmondson, W. T. (*Harvard U., Cambridge, Mass.*) Factors in the dynamics of rotifer populations. *Ecol. Monogr.* 16(4): 357-372. 11 fig. 1946.—A summary and discussion are given of the relatively small amt. of work which applies to production in populations of rotifers, and suggestions made for lines of future research. The general composition and the maximum size of the population are detd. by certain environmental factors, among which are the amt. of solid surface and the chem. nature of the water. The sizes of populations and changes in size are extensively discussed as functions of the rates of reproduction and death which are affected by the environment. Carlin's extensive data are used to demonstrate an apparent relationship between temp. and the rate of change of population size in 3 spp. which occur at different times of the year. Available data show that natural populations almost never increase at a rate commensurate with the potential reproductive rate, indicating that conditions for nutrition or survival, or both, are usually relatively unfavorable, compared to culture conditions. An estimate is made of the rates of grazing by *Brachionus* and the cladoceran *Daphnia* on *Diogenes* in Pennington's culture expts., and grazing is shown to have significant effects on the food population. The suggestion is made that in general studies of production it is at least as important to consider the rates at which populations change as it is to consider the actual amt. of standing crop from time to time.—*W. T. Edmondson.*

13517. Gibson, Walter William. (*LeMoyne Coll., Memphis, Tenn.*) An ecological study of the spiders of a River-Terrace forest in western Tennessee. *Ohio Jour. Sci.* 47(1): 38-44. 1947.—The land adjacent the Mississippi River and its tributaries in western Tennessee is typical swamp vegetation. As the land rises from the flood-plain level, a secondary terrace is apparent composed essentially of an Oak-Gum Community along the lowland and an Oak-Hickory along the upland, drier portions. Correlated with the transitional nature of the habitat, there is much variation in the spider population. However, the following spp. are considered diagnostic of the River-Terrace forest because

they occur in this habitat in great abundance while being scarce or absent in other vegetational associations thus far reported upon or studied: *Oxyopes aglossus*, *Anyphaena fraterna*, *Thiodina sylvana*, *Mangora placida*, *Dictyna cruciata*, *Theridion studiosum* and *Ebo latithorax*. During the warmer mos., vertical distribution of the spp. is characterized by stratal communities associated with physical factors and vegetation. Horizontal distribution is associated with varying moisture content of the soil. Two mass hatching periods are exhibited and most of the species hibernate in the ground-leaf stratum as young or adults. Of >5000 individuals taken over a 2-yr. period, *Latrodectus mactans* was not observed.—*W. W. Gibson.*

13518. Goldman, Edward A. (*U. S. Fish and Wildlife Serv., Washington, D. C.*), and Robert T. Moore. (*California Inst. Tech., Pasadena.*) The biotic provinces of Mexico. *Jour. Mammal.* 26(4): 347-380. Map. 1945.—Based on consideration of the geographic distribution of selected lists of mammals and birds as indicators, botanical and other data, the Mexican mainland and certain insular areas are subdivided into biotic provinces, named as follows: (1) California; (2) Guadalupe Island; (3) Vizcaino Desert; (4) Southern Baja California; (5) Revilla Gigedo; (6) Sonora; (7) Sierra Madre Occidental; (8) Chihuahua-Zacatecas; (9) Tamaulipas; (10) Sinaloa; (11) Nayarit-Guerrero; (12) Sierra Madre Oriental; (13) Transverse Volcanic; (14) Vera Cruz; (15) Sierra Madre del Sur; (16) Tehuantepec; (17) Chiapas Highlands; (18) Yucatan Peninsula.—*E. A. Goldman.*

13519. Kawaguti, S. Zooanthellae as a factor of positive phototropism in those animals containing them. *Palao Trop. Biol. Sta. Stud.* 2(4): 681-682. 1944.—The conclusion is reached that possibly the animals having zooanthellae in general show a positive phototropism.—*E. D. Merrill.*

13520. Park, Thomas. (*U. Chicago.*) Some observations on the history and scope of population ecology. *Ecol. Monogr.* 16(4): 313-320. 1 fig. 1946.—This paper—the introduction to a symposium held at St. Louis, Missouri, on March 28, 1946, entitled "Dynamics of production in aquatic populations"—falls into 4 parts of which the first 2 are historical, the 3d outlines the scope and research areas of modern population ecology, and the 4th summarizes the research activity within this field as suggested by various symposia and programs held at national conventions.—*Thomas Park.*

13521. Retzlaff, E. G. [Studies in population physiology with the albino mouse.] *Biol. Gen. [Vienna]* 14: 238-265. 1939.—Both death rate and reproductive rate proved to be dependent upon population density, the former being lowest, and the latter highest, in paired populations. Fights were observed both among ♂♂ and ♀♀; sometimes castrated ♂♂ were killed by ♀♀. A marked lowering of temp. lowers significantly the reproductive rate in 1 × 1 and 2 × 2 populations but only slightly in populations of higher density.—*Max Onno.*

## PLANT

13522. Anderson, W. A. (*U. Iowa, Iowa City.*) Development of prairie at Iowa. *Amer. Midland Nat.* 36(2): 431-455. 1946.—A prairie tract in n.-w. Iowa has been studied for the past 15 yrs. This paper includes detailed accounts of sample plots over the years 1935-1945, a comparison of frequency with another prairie tract in the vicinity, and lists of spp. found previous to 1935, with their status in 1944 and 1945. There have been very few changes in population of this tract since 1935, as evidenced by records of sample plots. Perennial spp. have increased, very largely by clonal expansion, and there is an invasion of tree spp. from wooded areas on the margins of the tract. 42 spp. are added to the published list of 1936. There is little evidence of spp. having disappeared from the area. Photographic illustrations show extent of changes, particularly with reference to tree growth. This is the record of a long term expt., attempting to discover what may happen to any such area which is kept unmolested over a period of yrs.—*W. A. Anderson.*

13523. Böcher, Tyge W. Some experiments to elucidate the influence of winter conditions on shoot development and floral initiation on various races of *Prunella vulgaris* and *Ranunculus acris*. *Dansk Bot. Ark.* 12(3): 1-16. 5 fig. 1945.—Expts. were made with subalpine-N. Atlantic and



temperate races of *R. acer* supplemented with an expt. with a single type of *Pulsatilla pratensis*. When plants of one of the temperate Ranunculids and of *P. pratensis* were withdrawn from winter conditions, the flowering was retarded; such an effect was not observed in the N. Atlantic Ranunculids. Several similar expts. were made with a number of races of *Prunella vulgaris*. Of these, it is especially an annual South European race, a northern race which, when cultivated, flowers in the 1st season (derived from a dry locality), and a northern race flowering, when cultivated, in the 2d season (from a damp locality) which attract attention. The South European race may flower throughout the whole winter if exposed to high temps.; the flowering of the type which flowers the 1st yr. is inhibited if it is not exposed to winter conditions, for if so, it will develop a smaller number of spikes. Finally, the type flowering the 2d yr. does not flower at all if kept in a warm place during the winter. Even plants which have been exposed to severe frost until Feb. 12th and then kept in a heated place, will not flower the succeeding summer. A special expt. shows that we are here concerned with a photoperiodic effect, these plants being long-day plants.—*T. W. Böcher*.

13524. Dansereau, Pierre. L'érablière laurentienne. II. Les successions et leurs indicateurs. [The Laurentian maple tree. II. The successions and their indicators.] *Canadian Jour. Res. Sect. C. Bot. Sci.* 24(6): 235-291. 7 fig. 1946.—A scheme is presented to define the principal lines of succession in the area of the deciduous forest of the St. Lawrence valley. The climax is *Aceretum saccharophori laurentianum*, a deciduous forest dominated by *Acer saccharophorum*. This climax of the evolution of the regional vegetation is reached in 5 principal ways. In the course of the succession, gradual improvement of the site is effected by the pioneer and sub-climax associations. The latter are described briefly as to their floristic dominants and their phytosociological role. The various successions often have a subterminal stage very near the climax, with which it is confused in many essential characteristics, but in which the final evolution is inhibited by topographic or microclimatic causes, and where elements, typical of the series from which they come, still persist. These quasi-climaxes and the climax itself are described in some detail, as well as the unions which characterize the structure. After thus defining the "prisère", some elements of the "subère" are analyzed: the maple trees where human intervention is being or has been exercised. These disclimaxes are especially of 2 types, according to whether the degradation depends on wood cutting or pasturage. Conditions unknown in the "prisère" are then realized, which permit new equilibria to be established according to the adaptive capacity of the spp. These associations, these facies, these unions or these biotypes owe their duration, evidently, only to the more or less regular repetition of the intervention.—*Auth. abst. (transl.)*

13525. Florschütz, F., und F. P. Jonker. Über die Flora des Mindel-Riss-Interglazials in den Niederlanden. *Rec. Trav. Bot. Neerland.* 39: 176-188. 1 fig. 1942.—*Azolla filiculoides*, now an adventitious plant in the Netherlands, was widely spread in that country during the penultimate interglacial period. With some reserve it is considered as a guide for fossil sediments of that interglacial, the Needian. The Needian flora includes about 50 spp. Besides *Azolla*, the most important are *Salvinia cf. natans*, *Aldrovanda vesiculosa*, *Decodon globosus*, cf. *Staphylea* spec., *Stratiotes intermedius*, *Trapa cf. natans* and *Vitis cf. sylvestris*. Of these genera only *Stratiotes* is nowadays indigenous in the Netherlands. 19% of the Needian spp. are now exotic, whereas this is the case with 40% of the spp. of the Teglian flora (1st interglacial) and with 88% of the spp. of the Pliocene Reuverian flora.—*F. Florschütz*.

13526. Humphrey, R. R. Range forage evaluation by the range condition method. *Jour. Forest.* 45(1): 10-16. 1947.—Range land is first separated into plant-ecological types and second, into sites within these types based upon productivity. Within each type and site 5 relative condition classes are delineated based upon their % of maximum potential forage production. Factors considered are principal plants, plant vigor, litter accumulation, erosion, and forage density.—*E. A. Colman*.

13527. Linders, John. *Cyperus fuscus* vid Vombsjön. [C. fuscus at Vombsjön.] *Bot. Notiser* 1946(1): 124. 1946.—In the regulation of Kävlinge River, the water level of

Lake Vombsjön was lowered considerably resulting in exposure of a marginal belt varying from 2 to 100 meters in width. By the 2d yr. of exposure, this belt was invaded by plants. Among these were many clumps of *Cyperus fuscus* which had never before been seen in this locality.—*H. L. Blomquist*.

13528. McLean, R. C., and W. R. Ivimey Cook. Practical field ecology. 207p. Frontispiece, 30 fig. George Allen and Unwin, Ltd.: London, 1946.—The authors describe the apparatus used by classes on their field trips and the containers in which it is packed for convenient, safe transportation. Methods of making an ecological survey of a selected area and recording the results are described in detail. Among the topics considered are simple surveying techniques, the laying out of grids and transects, and methods of mapping and recording the vegetation on the areas studied. Quantitative studies by the use of quadrats, and sociological studies are also explained. Methods are described for the study of soils, for limnological studies of ponds and streams, and for measurement of various environmental factors. A chapter is devoted to ecological studies of the seashore and another chapter to the prepn. and use of an ecological herbarium. Keys to the common basidiomycetes and the chief genera of marine algae and a key to grasses based on vegetative characters are provided for the use of students.—*P. J. Kramer*.

13529. Mahoney, Murrelle. Wooden almanac. *Southern Lumberman* 173(2177): 147-148. 4 fig. 1946.—A popular account of the discovery by Dr. A. E. Douglass and associates of a wood beam at Oraibi, a Hopi pueblo, with origin dating to 1237, thus making possible the linking of old and new chronologies by the method of dendrochronology.—*T. C. Scheffer*.

13530. Netolitzky, F. Fragestellungen zur nacheiszeitlichen Geschichte heimischer Gewächse. [Questions concerning the postglacial history of native German plants.] *Ber. deutsch. bot. Ges.* 61: 219-230. 1943.—The author investigates the plant life of the Tundra in connection with the distribution of the loess, the formation of the black earth and the behavior of *Betula*, *Salix*, *Pinus*, *Corylus*, of the oak mixed forest and of the cultivated plants. In a last part he treats the reciprocal reactions between plants and man in postglacial time.—*W. Golhan*.

13531. Prát, S. Rašelyny a slatiny po stránce biologické. [Peat bogs and swampy meadows from a biological point of view.] *Věstník Československé fyziotrické společnosti Praze (Bull. Czech. Soc. Physiatrics, Prague)* 23: 15-27. 1944.—After discussing the biological conditions which lead to the formation of different kinds of organic sediments, the author discusses in detail the typical genera of plants which have formed the primary flora of the peat bogs and swampy meadows, and describes the biol. processes and exogenous conditions which lead to the formation of different final products.—*S. Prát*.

13532. Selling, Olof H. Studies in Hawaiian pollen statistics. I. The spores of the Hawaiian pteridophytes. *Spec. Publ. Bernice P. Bishop Mus.* 37: 1-87. 7 pl. 1946.—A monographic survey of the spores of the Hawaiian pteridophytes for pollen analysis; referring to their appearance as acetolyzed fossils. Two keys are given: one general and one to the spores of the Hawaiian spp. of *Lycopodium*. For each genus and sp. considered to deserve one, a survey of notes on spore morphology in literature and a detailed, illustrated description of the material at hand, followed by an account of certain data as to recent occurrences compiled from a pollen statistical point of view, together with a summary of fossil occurrences. One species, *Schizaea skottsbergii*, is not known in the recent flora.—*O. H. Selling*.

13533. Vogt, T. Geokjemisk og geobotanisk malmletting. II. *Viscaria alpina* (L.) G. Don som "kisplante". [Geochemical and geobotanical ore prospecting. II. *V. alpina* as ore indicator.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 15: 5-8. 1942.—The occurrence of *V. alpina* on different rocks, particularly on serpentine, dunite, and at the outcrops of cupriferous pyrite deposits in Norway, is discussed. The thriving of the plant at these ore deposits is presumed to be principally due to its withstanding large amts. of Cu, etc. in the soil, the plant being thus left without competitors.—*Auth. summ.*

13534. Vogt, T. Geokjemisk og geobotanisk malmletting. III. Litt om planteveksten ved Rørosmalmene. [Geochemical and geobotanical ore prospecting. III. Some

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13535. Vogt, T., og O. Braadlie. Geokjemisk og geobotanisk malmleting. IV. Plantevekt og jordbunn ved Rørosmalmen. [Geochemical and geobotanical ore prospecting. IV. Vegetation and soil at the Røros ores.] *K. Norske Vidensk. Selskab Forhandl.* [Trondhjem] 15: 25-28. 1942.—In the Røros area (Norway) there are areas of ore-poisoned soil with scanty vegetation or none. For chemical analyses samples have been taken of the soil among the roots of the various plant spp. growing there. The decisive poison agent was probably Cu, possibly also  $\text{FeSO}_4$ . There was up to 300 times as much Cu as in normal soil. *Melandrium dioicum* tolerated the most Cu, viz., 650 mg. per 100 g. of desiccated soil (the particles >1 mm. having first been removed), *Salix herbacea* 401.7, then came *Betula nana*, and others.—O. A. Höeg.

13536. Vogt, T., og J. Bugge. Geokjemisk og geobotanisk malnletning. VIII. Bestemmelse av kobber i planter fra Rørosfeltet ved kvantitativ røntgenanalyse. [Geochemical and geobotanical ore prospecting. VIII. Determination of contents of Cu in plants from the Røros area by means of quantitative X-ray analysis.] *K. Norske Vidensk. Selskab Forhandl.* [Trondhjem] 16: 51-54. 1943.—The geochemical ore prospecting method of Sven Palmquist, starting from the general achievements of V. M. Goldschmidt, is based on the fact that many elements from ores are concentrated in plants growing on or near covered outcrops of the ores. The present paper shows results of quantitative X-ray copper analyses of different plant spp., partly growing on soil rich in Cu, and partly on normal soil. The leaves of bushes contain more Cu than the stems, and the dwarf-birch more than willows. *Melandrium dioicum*, and *Equisetum arvense*. It is recommended to use material of only one plant species, or group of spp., for trace element investigations, leaves of the birch spp. being well suited. To judge from the present material, the method does not seem very useful as regards Cu in Norwegian areas.—*Auth. summ.*

13537. Vogt, T., O. Braadlie, og H. Bergh. Geokjemisk og geobotanisk malmleting. IX. Bestemmelse av Cu, Zn, Pb, Mn, og Fe i planter fra Rørosfeltet. [Geochemical and geobotanical ore prospecting. IX. Determination of Cu, Zn, Pb, and Fe in plants from the Røros area.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16: 55-58. 1943.—In dwarf birch, willows, *Melandrium dioicum*, and *Equisetum arvense*, growing partly on soil at a sulfidic copper deposit and partly on normal soil, heavy metal analyses (tabulated) did not make it probable that detn. of Cu and Zn in plants would be very useful as an ore-prospecting method in these areas. The Zn content in the plants was remarkably high, the average ratio Cu:Zn being about 1:8.5.—*Auth. summ.*

13538. Waterfall, U. T. Observations on the desert gypsum flora of southwestern Texas and adjacent New Mexico. *Amer. Midland Nat.* 36(2): 456-466. 1946.—The author lists and discusses collections of plants taken from desert gypsum areas principally in Hudspeth, Culberson and Reeves Counties, Texas, and Eddy and Chaves Cos., New Mexico, during parts of the summers and falls of 1942-'45, incl. The collections are summarized in a list of 90 spp. which is followed by an annotated enumeration of 34 spp. representing a definite and distinctive gypsum flora. *Coldenia hispidissima* is found to be as characteristic of desert gypsum as *Larrea divaricata* is of the adjoining calcareous deserts. In the area studied it also serves as a positive indicator of gypsum in xeric habitats not easily recognized as gypsumous. Several previously little-known spp. such as *Selinocarpus lanceolatus*, *Abronia nealeyi*, *Frankenia jamesii* and *Nama carnosum* are found to be obligate gypsophiles.

*Limonium vincentii*.—*U. T. Waterfall*.  
halophytic-gypsophiles. — *Bot. Mus., Copenhagen, Denmark*.  
13539. Wiinstedt, K. (*Bot. Tidsskr.* 47(2): 144-244.  
*mark.*) Cyperaceernes Udbredelse i Danmark. II. Carim-  
coideae. [Survey of the geographical distribution of the  
Danish species of Carex.] *Bot. Tidsskr.* 47(2): 144-244.  
55 maps. 1945.—The present paper is the final one of the  
papers dealing with the distribution of the Cyperaceae within  
Denmark and in its classification of the spp. agrees fairly well  
with the papers previously published concerning the topo-  
graphic-botanical investigation of Denmark. After some  
general botanical considerations, all the 55 spp. of *Carex*  
found in Denmark and mentioned in C. Raunkiaer, *Dansk*  
*Ekskursionsflora*, 6th edition, 1942, are treated in the follow-  
ing chapters: Geographic distribution, occurrence in Den-  
mark, and dispersal. On p. 233 a survey is taken of the geo-  
graphic distribution of the spp. in relation to an Atlantic or  
a continental floral area, viz., Atlantic spp., circumboreal  
spp., circumpolar spp., and continental spp. Then follows  
a survey of the distribution of the spp. in Denmark, which  
shows that they are primarily edaphically conditioned, and  
that it is only a minority of plants to which the climate is of  
any importance, notably such as have part of their northern  
limit in Denmark. Otherwise the reader is referred to the  
*Biological Notes* on p. 237, where the dispersal of the spp. is  
especially treated. The paper ends with 55 maps showing  
the distribution of the spp. in Denmark.—*K. Wiinstedt*.

# OCEANOGRAPHY

(See also Entries 13516, 13519, 13528, 14992, 15049, 15572, 15998, 16011, 16015, 16017, 16021, 16023, 16025, 16035, 16036, 16053, 16147, 16148, 16149, 16192, 16211, 16230)

[illegible]

13541. Abe, N. Growth of *Fungia actiniformis* var. *palawensis* Döderlein and its environmental conditions. *Palao Trop. Biol. Sta. Stud.* 2(1): 105-145. 11 fig. 1940.—Detailed studies. — 1941. Observations on a limpet-

13542. Abe, N. Ecological observations on a limpet-like pulmonate, *Siphonaria atra* Quoy et Haimard. *Palao Trop. Biol. Sta. Stud.* 2(2): 239-278. 8 fig. 1941.—A detailed study; bibliography.

13543. Clarke, G. L. (*Harvard U., Cambridge, Mass.*)  
Dynamics of production in a marine area. *Ecol. Monogr.*  
16(4): 321-335. 9 fig. 1946.—A consideration of the pro-  
ductivity of a natural area should involve the concepts of  
(1) standing crop, (2) material removed, including the yield  
to man, and (3) the production rate. The production rate  
of the organisms at different trophic levels should be con-  
sidered separately and distinction made between gross pro-  
duction (assimilation), net production (growth), and net  
increase in the standing crop per unit time. Diagrams are  
presented illustrating the interrelations between the processes  
of production, consumption, and decomposition at the various  
levels in the ecological complex. The application of the fore-  
going concepts to a marine area is illustrated using data from  
Georges Bank. The nature of the fundamental factors  
underlying the productivity of the bank is pointed out with  
a consideration of the quantitative relationships insofar as  
the existing measurements permit. Values for the standing  
crop and for the net production of the phytoplankton and the  
zooplankton are presented with a discussion of the controlling  
influence of the reduction of light in the water and of the dis-  
turbance due to currents. Values for the yield of the com-  
mercial catch of fish from the bank are compared with yields  
obtained from fresh-water and terrestrial areas.—G. L.  
Clarke.

13544. Clarke, George L. (Harvard U., Cambridge, Mass.) Poisoning and recovery in barnacles and mussels. *Biol. Bull.* 92(1): 73-91. 1947.—Direct tests were performed on the conchs. and exposures of a variety of metallic salts necessary to kill barnacles (*Balanus balanoides* and *B. eburneus*). The toxicities of mercury, cupric citrate, cupric tartrate, cupric salicylate, and cupric aminobenzoate were found to be slightly less than the toxicity of basic cupric carbonate. The toxicity of silver is about equal to that of basic cupric carbonate, but the toxicity of zinc is very much less.

The rate of killing of barnacles by cupric citrate is proportional to the conc. of the toxic over the range tested. An extremely high conc. of Cu or of Hg salts was necessary to prevent the metamorphosis of cyprids attached to glass plates. The results show the difficulty of preventing the initial attachment of cyprids, or their metamorphosis, by the use of copper paints. Moderate concs. of cupric citrate seriously retard the development of the newly metamorphosed barnacles and prevent the 2d step in attachment, namely, the formation of the cemented calcareous base. Exposure of the newly metamorphosed barnacles to very low concs. of cupric citrate accelerated development beyond that of the normal animals. The soft tissues of adult barnacles normally contain a much higher conc. of Cu than does sea water. When placed in solns. of cupric citrate, barnacles absorbed >100 times the normal Cu content of the tissues. In no case were barnacles killed by the absorption of <0.19 mg. of Cu per g. of dry wt.—>10 times the normal content. In some cases barnacles which had absorbed 0.5 mg. to 1.09 mg./g. from toxic solns. revived when replaced in fresh sea water. When replaced in fresh sea water, barnacles can eliminate from their tissues as much as  $\frac{2}{3}$  of the Cu which has been absorbed from toxic solns. Mussels (*Mytilus edulis*) are more sensitive to poisoning by cupric citrate than barnacles. When exposed to Cu solns., mussels take up Cu more rapidly than do barnacles, and when replaced in fresh sea water, they eliminate it from their tissues more rapidly and extensively. In many cases in which a considerable portion of the Cu was eliminated, the mussels nevertheless succumbed subsequently.—G. L. Clarke.

13545. Hiro, F. On the barnacle communities at the Madarai pier in Koruru Island, Palao. *Palao Trop. Biol. Sta. Stud.* 1(4): 585-595. 5 fig. 1939.—Involves representatives of the genera *Chthamalus* and *Tetrachita*.—E. D. Merrill.

13546. Kanda, T. Ecological studies on marine algae from Koruru and adjacent islands in the South Sea Islands. *Palao Trop. Biol. Sta. Stud.* 2(4): 733-800. Map, 27 fig. 1944.—Basically an ecological study, but with a tabulated list of approx. 125 spp. that were considered.—E. D. Merrill.

13547. Kawaguti, S. Study on invertebrates associating unicellular algae. I. Placobranchus ocellatus von Hasselt, a nudibranch. *Palao Trop. Biol. Sta. Stud.* 2(2): 307-308. 3 fig. 1941.—The spp. studied were associated with the plant spp. of *Enhalus* and *Halimeda*. The associated alga is not named.—E. D. Merrill.

13548. Kawaguti, S. On the physiology of reef corals. V. Tropisms of coral planulae, considered as a factor of distribution of the reefs. *Palao Trop. Biol. Sta. Stud.* 2(2): 319-328. 3 fig. 1941.—Distribution of the species studied may be detd. mainly by the positive phototaxis and negative geotaxis of the planulae.—E. D. Merrill.

13549. Marchand, John F. (Yale U. Sch. Med., New Haven, Conn.) DDT as a marine antifouling agent. *Science* 104(2691): 74-75. 1946.—Paint containing 20% DDT by wt. and applied to a boat accumulated no barnacles after about 2½ mos. of use in sea water. DDT, either alone or mixed 20% by wt. in paint, and applied to an iron-bound keg which floated in sea water for 3 mos., had little inhibitory effect on marine algae or other organisms which foul ship bottoms. DDT did not wash away in sea water over a 4-month period and retained its effectiveness as a component of paint. It did not affect the drying properties or durability of the paint.—H. M. Kaplan.

13550. Matsuya, Z. Some hydrobiological studies of the water of Iwayama Bay in the South Sea Islands. *Palao Trop. Biol. Sta. Stud.* 1(1): 95-135. 5 fig. 1937.—Marked diurnal changes noted, plankton very limited; list of organisms observed provided.—E. D. Merrill.

13551. Matué, Y. Systematic studies of the plankton organisms occurring in Iwayama Bay, Palao. II. List of diatoms occurring in the bay. *Palao Trop. Biol. Sta. Stud.* 2(3): 521-525. 1942.—A list of 76 spp., none new.—E. D. Merrill.

13552. Motoda, S. Submarine illumination, silt content and quantity of food plankton of reef corals in Iwayama Bay, Palao. *Palao Trop. Biol. Sta. Stud.* 1(4): 637-649. 1939.—Of the spp. of corals studied, the common reef corals thrive in

a submarine illumination of 30-40% of surface light.—E. D. Merrill.

13553. Motoda, S. A study of the growth rate of the massive reef coral, *Goniastrea aspera* Verrell. *Palao Trop. Biol. Sta. Stud.* 2(1): 1-6. 1940.—Detailed studies on 26 colonies.—E. D. Merrill.

13554. Motoda, S. Comparison of the conditions of water in the bay, lagoon, and open sea in Palao. *Palao Trop. Biol. Sta. Stud.* 2(1): 41-48. 2 fig. 1940.—No marked differences in temp., O<sub>2</sub> content, pH value, and specific gravity were noted. Macro- and microplankton were richer on the inside of the barrier reef than in the open sea.—E. D. Merrill.

13555. Motoda, S. The environment and the life of massive reef coral, *Goniastrea aspera* Verrell, inhabiting the reef flat in Palao. *Palao Trop. Biol. Sta. Stud.* 2(1): 61-104. 9 fig. 1940.—Detailed comparative studies.—E. D. Merrill.

13556. Motoda, S. Plankton productivity of Iwayama Bay in Palao, South Seas. *Palao Trop. Biol. Sta. Stud.* 2(2): 210-238. 8 fig. 1941.—Plankton productivity is small; 2 dinoflagellates were frequently found in the lower layers of stagnant waters.—E. D. Merrill.

13557. Nielsen, E. Steemann. Über das Frühlingsplankton bei Island und den Färöer-Inseln. *Meddel. Komm. Havundersøgelser Ser. Plankton [Denmark]* 3(6): 1943.—From the middle of March to the beginning of June, 1936, phytoplankton was collected every fortnight from 4 stations in the waters around Iceland. In the open sea between Iceland and the Faroes, plankton production did not start till some time in May; in the partially sheltered Fakse Bay it started at the beginning of April. Along the south coast of Iceland the production approached the spring max. about the middle of April. However, the plankton disappeared almost completely again; not till the end of May did the maximum set in here in earnest. The importance of the weather conditions—especially of the wind—for the beginning of the spring maximum is demonstrated. The investigations near the Faroes were made in the first days of May, 1938. The quantities of plankton found along the open shores were inconsiderable. In the threshold fjords and in other sheltered places, however, a rich plankton was met with. The vertical distribution of the plankton was closely studied. This applies both to the phyto- and the zooplankton.—E. S. Nielsen.

13558. Oliveira, Lejeune P. H. de. (Inst. Oswaldo Cruz, Rio de Janeiro, Brazil.) Classificação hidrobiológica das águas do Oceano Atlantico no litoral do Brasil. [Hydrobiological classification of the waters of the Atlantic Ocean in the Brazilian littoral.] *Mem. Inst. Oswaldo Cruz [Rio de Janeiro]* 42(1): 190-206. 1945.—This paper proposes the new notion of Bio-Oceanographical Department, that is, the mass of coastal water presenting together common biological and oceanographic characteristics. There are, for instance, 4 departments in Brazilian littoral. In the first Amazon Bio-Oceanographical Department the coast water is of low salinity, tropical, muddy shore with mangrove, which characteristics are presented as a whole, including a geographical, geological, hydrographical, meteorological, oceanographical and biological aspects. The departments are divided into bio-oceanographical sections and these into districts; Guanabara Bay is, for instance, a bio-oceanographical district. The author arrived at this classification from the comparative study of the peculiar crustacean fauna in relation to the oceanographic conditions of Brazil.—Lejeune de Oliveira.

13559. Pope, Elizabeth C. Denizens of the boom piles. *Australian Museum Mag.* 9(2): 40-45. 1946.—When the piles were removed from Sydney harbor following the war, naturalists were given an opportunity to study a boom pile community. Shipworms, barnacles, mussels, sea squirts, sea urchins, sponges, spider crabs, brittle stars, bryozoans and others were crowded together with the heaviest growths about the middle section—10-15 ft. above the mid-line to 5-6 ft. below the high water mark. Some evidence of stratification could be observed.—R. H. Adams.

13560. Takahashi, K. On some castings of sand in Koror Island of the Palao group. *Palao Trop. Biol. Sta. Stud.* 1(3): 459-468. 8 fig. 1938.—The genera *Thalassina*, *Arenicola*, *Dolichoglossus*, *Brissus*, *Sipunculus* and certain annelids are involved.—E. D. Merrill.

13561. Tokioka, T. Systematic studies on the plankton



organisms occurring in Iwayama Bay, Palao. I. Introductory notes, with some references to the surface water temperature and the settling volume of planktons in the bay. *Palao Trop. Biol. Sta. Stud.* 2(3): 507-519. Map, 1 fig. 1942.—A preliminary study.

13562. Ulyott, P., and O. Ilgaz. (U. Istanbul, Turkey.) Observations on the Bosphorus. III. The degree of turbulence. *Istanbul Üniversitesi Fen Fakültesi Mecmuası (Rev. Fac. Sci. Univ. Istanbul) Ser. B. Sci. Nat.* 11(2): 107-123. 1946.—The waters of the Bosphorus usually consist of mixtures of 2 homogeneous solutions. Temp. and salinity changes may be measured in a surface column of Black Sea water as the column progresses southward through the Bosphorus over an arbitrarily chosen isohaline plane. The water in the column becomes progressively more salty as turbulence mixes successively larger quantities of underlying salty water with it, and the turbulence diffusion coefficient can be obtained by applying the Kramp-Laplace error-integral equation to the temp. and salinity measurements. The intensity of turbulence is dependent on the velocity of the upper Bosphorus current.—R. W. Pennak.

#### LIMNOLOGY

(See also Entries 13516, 13572, 15047, 15051, 15986, 15987, 15997, 15999, 16006, 16016, 16018, 16037, 16051)

13563. Fjordingstad, E. Planktonstudien. I. Zur Ausbreitung der *Microcystis aeruginosa* Kütz. emend. W.-L., *Microcystis flos-aquae* (Witt.) Kirchner emend. W.-L. und *Microcystis viridis* (A. Br.) Lemmermann. II. Das Phytoplankton im Vejle Sø im Sommer 1943 nebst einigen systematischen und biologischen Bemerkungen. *Dansk Bot. Ark.* 12(1): 1-21. 1 fig. 1945.—I. On the basis of Teiling's revision of *M. aeruginosa* and *M. flos-aquae*, the occurrence of these spp. in a number of fresh waters has been investigated. Teiling's assumption, that *M. viridis* also occurs in Danish waters, was confirmed. The frequency of occurrence of *M. aeruginosa* and *M. flos-aquae* has been estimated on the basis of the material mentioned in the succeeding paper.—II. In the period May 3d-Sept. 27th, net plankton samples were collected at intervals of 0.1 day. The seasonal occurrence of the 51 spp. found is demonstrated and some spp. are dealt with at some length. *Anabaena planctonica* is compared with a number of related spp., vars., and forms, which are regarded as habitat modifications of the main species.—Sjgurd Olsen.

13564. Krueger, Friedrich. (Hydrob. Anst. Plön, Germany.) Parthenogenetische Stylotanyarsuslarven als Bewohner einer Trinkwasserleitung. (Tanyarsus-Studien. III. Die Gattung Stylotanyarsus). *Arch. Hydrobiol.* 38(2): 214-253. 5 fig. 1941.—Larvae of *S. inquilinus* appeared in 1937 in the drinking water of a German town, and caused some concern among the inhabitants for 2 yrs. As all sources of external infection soon were eliminated, propagation must have occurred in the pipelines in an earlier stage of the metamorphosis. Cultures in the laboratory showed that the pupae propagate parthenogenetically. This fact is not to be considered as a pedogenesis, but the imagines do not throw off their pupa-skin and the eggset remains at first within the membrane. As the *Stylotanyarsus* is parthenogenetic obligatorily, the eggs develop without fertilization. Thus the pedogenesis of the pupa really is an early parthenogenesis of the imago. Natural limiting factors being absent in the pipelines, the larvae increased rapidly in number. The pipes were rinsed with water to which Pyrethrum was added (5 g./m<sup>3</sup>) and after some failures caused by incomplete disinfection of certain pipes, were successful. *S. inquilinus* and 6 other spp. of the genus are descr. and ecologically characterized.—Ingo Findenegg.

13565. Pennak, R. W. (U. Colorado, Boulder.) The dynamics of fresh-water plankton populations. *Ecol. Monogr.* 16(4): 339-355. 7 fig. 1946.—The general composition and nutritional interrelationships of the fresh-water plankton ecosystem are discussed, with emphasis on the role of bacteria. Although a bimodal annual plankton curve, with spring and autumn pulses, is characteristic of some lakes of medium to large area and depth, conditions in smaller and shallower lakes may be highly variable. Year-round studies on northern Colorado lakes showed no pulses, or 1, 2, or 3 pulses at various other times of the yr. Recent trends in the study of environmental factors influencing the quantita-

tive and qualitative composition of the plankton are based on the interaction of many factors, some of which are difficult to measure. The significance of nutrients as limiting factors, ratios of ions, trace elements, and the probable biochemical significance of some of the many dissolved organic compounds are emphasized. The major portion of the food of zooplankters consists of detritus rather than living algae. There is little evidence that the grazing of zooplankton has an important effect on the control of phytoplankton populations under natural conditions, and there are seldom any numerical relationships between pulses of zooplankton and phytoplankton. Much fundamental research remains to be done on food requirements and special food habits of zooplankters, reproductive rates of all groups of plankters under varying environmental conditions, intra- and interspecific competition, and optimum densities. Representative measurements of plankton production should be based on a consideration of year-round, rather than seasonal, conditions. The mean annual standing crop is a general index which reflects the sum total of ecological conditions in a lake. It may be expressed in a variety of ways, including total seston per liter or hectare of lake surface, number of algae per liter, and zooplankters per liter. Total seston is probably the most significant means of expression for purposes of comparative limnology. When more details of the dynamics of the plankton ecosystem have been established, it should be possible to utilize mean annual standing crop data for the calculation of rate of production at the various trophic levels with reasonable accuracy.—R. W. Pennak.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 13543, 14776, 15908, 16150, 16151, 16152, 16153, 16154, 16156, 16164, 16165, 16166)

13566. Couteaux-Bargeton, M. Variations du taux de glycogène dans différents organes de l'huître. [Variations in glycogen content of different organs of the oyster.] *Bull. Soc. Zool. France* 71(3): 121-128. 1947.—The important seasonal variations noted in the glycogen content of the gonads is directly related to the variations of the vesiculous conjunctive tissue between the genital follicles. In all the organs studied, the glycogen content shows important variations, all in the same direction. During gametogenesis, in both ♂ and ♀ forms, the glycogen content of the digestive complex falls to a low value. In winter, and following periods of violent cold, the glycogen content may show a sudden and significant decrease (from 7% of fresh wt. to 0.6%).—Renaud Paulian.

13567. Gudger, E. W. Tickling fish. *Nat. Hist. [New York]* 56(1): 46. 1947.—The art of catching fish by tickling their sides dates back to 120 A.D. and is practiced in many parts of the world.—G. H. Kelker.

13568. Khan, Hamid. Development of fisheries in Punjab. I. Conservation. *Indian Farming* 7(5): 234-236. 1946.—Measures for the protection of fish through legislation, through the control of predators, and the creation of sanctuaries are discussed briefly.—K. L. Anderson.

13569. Ottestad, Per. On periodical variations in the yield of the great sea fisheries and the possibility of establishing yield prognoses. *Fiskeridirektoratets Skrifter Serie Havundersøkelser (Rept. Norwegian Fish. and Marine Invest.)* 7(5): 1-11. 1942.—Because of great fluctuations in yield of the great sea fisheries the planning of the fishing industry is difficult. Variation in size of year-classes is one of the important factors in fluctuation of annual yield. Forecast of yield by observing variations in size of stock appears to be more or less reliable, but is expensive and not simple in practice. Climatic factors affecting variations in annual growth-zones of forest trees may also affect the death rate in skrei fry. Periodical variations discussed are 11, 17½, 23, and 57 yrs. If it can be proved that fluctuations in annual yield follow the composite trends of a small number of periodical variables a method would be found by which a forecast of annual yield can be made. Even if fishing technique is altered, such a forecast would help simplify planning of fishing industry. This is a preliminary investigation covering only 55 yrs. but deserves further investigation.—J. S. Dendy.

13570. Schmidt-Nielsen, S., and K. T. Eriksen. On the liver oil of the basking-shark. *K. Norske Vidensk. Selskab Forhandl. [Trondheim]* 17: 138-141. 1944.—In recent years the basking-shark, *Selache maxima*, again appears

frequently in summer off the coast of Trøndelag, and is caught in hundreds. The authors analyzed samples of livers of 13 specimens, each with an estimated wt. between 2,000 and 3,000 kg. and a liver wt. between 600 and 1,100 kg. Information as to the sex of the different fishes could not be obtained. The samples contained 67.3-77% fat. There is 2.2-7% pristan in the oil, and 7-43% squalene, both obtainable by distillation in vacuo at 120°-150° and 195°-220°C, respectively. The problem of the variation in the composition due to sex and nutrition conditions is not yet solved.—O. A. Høeg.

13571. Sivertsen, E. Om vekttapet hos levendetsorsk i fiskekummer. [Loss in weight of living cod in tanks.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16: 5-7. 1943.—29 cod, individual wt. 500-1970 g., average 1109 g., age 2½ and 3½ yrs., were kept for 1 month in an aquarium of 1 m.<sup>3</sup> at 12-14°C without being fed. 3 fishes died. If these are excluded, the loss in wt. was altogether 6%, varying from 0 to 16%. Including the 3 dead fishes, the total loss was 20.4%.—O. A. Høeg.

13572. Székessy, V. Ein Beitrag zum Nahrungsproblem der Fische. *Arch. Hydrobiol.* 38(3): 451-453. 1941.—In the intestines of 6 specimens of fish 7 spp. of Coleoptera were found. Apparently beetles may be an important fish food. Probably *Thymalus vulgaris* in Finland feeds regularly on *Haemonia mutica*.—Ingo Findenegg.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 15889, 16208, 16212, 16214, 16220, 16223, 16226, 16228, 16229, 16231, 16232)

13573. Gabrielson, Ira N. (*Wildlife Management Inst., Washington, D. C.*) Education and wildlife conservation. *Trans. North Amer. Wildlife Conf.* 10: 203-209. 1945.—Present conservation information is reaching chiefly those persons who are interested or who already have come in contact with conservation problems. More effort should be directed toward the instruction of people who are not aware of conservation problems. Individuals and institutions should coordinate their efforts by: encouraging basic conservation programs in school curricula; using more modern methods of disseminating information, possibly following some of the patterns used by large commercial advertising agencies; and developing facilities for the rapid application of research findings. Conservation of our total natural resources is considered rather than just wildlife.—G. H. Breidling.

13574. Herbert, Paul A. (*Michigan State Coll., East Lansing.*) The botanist's place in Michigan's conservation program. *Metropolitan Detroit Sci. Rev.* 7(3): 23, 52. 1947.—Botanists are invaluable in establishing conservation policies and programs. Their training in taxonomy, forestry, and ecology and their knowledge of wildlife balance, soil and flood controls is helpful in establishing policies for the preservation of wildlife through proper maintenance of necessary plant life.—Sister Rose Angela Mayer.

13575. Hiatt, Robert W. (*U. Hawaii.*) The relation of pheasants to agriculture in the Yellowstone and Big Horn River Valleys of Montana. *Montana State Fish and Game Comm. Bull.* 72p. 14 pl., 8 fig. 1946.—This investigation was designed to clarify the controversy over the relation of ring-necked pheasants to agriculture in 2 irrigated valleys of Montana where pheasants are especially abundant. Food and feeding habits were analyzed both by field observation and investigation, and by crop analysis of 500 birds taken throughout the year in places where damage to cultivated crops might occur. Analyses were made by frequency of occurrence, by number, by weight and by volume. Pheasants took most of their food in late afternoon, and during their foraging they rarely traveled >¼-mile. Although the feeding habits of individual birds were variable, birds of the same flock consumed a similar diet. Vegetable constituents comprised 96% by number and 88% by wt. and volume of the total annual food. Grains, chiefly derived from field waste, lead all food categories. Wheat and barley were most important with corn and oats ranking lower. Although weed seeds constituted a large proportion of the food taken, it is doubtful that the following year's weed crop would be significantly affected. Green plant material and wild fruits composed a small amt. of the total food consumed but were probably important as an essential component of the diet and an emergency food, respectively. Cutworms led the list of

animal foods consumed, and during the cutworm season the pheasants averaged 8 daily. The crop of one pheasant contained 213 cutworms. Food items representing actual pheasant damage to agriculture comprised 7% by number and 15% by wt. and volume of the total food consumption. Items constituting beneficial aspects of pheasants to agriculture composed 41% by number, 17% by wt. and 18% by volume; items representing farm waste constituted 40% by number, 62% by wt. and 60% by volume. The remaining food consisted of items neutral to the agriculturalist. It was estimated that the beneficial influences of pheasants on agriculture and the agricultural community (direct, indirect and intangible) were at least equal to and probably outweigh negative values. Isolated areas, however, sustained considerable local damage by pheasants, and local control by live-trapping during the winter months was recommended. It was also recommended that efforts be made to place farmer-sportsman cooperation upon a higher level of attainment, because one of the chief objections of the farmer to the presence of pheasants is that a few thoughtless, selfish or vicious hunters exhibit little or no respect for the property rights of the landowner. Until this type of "sportsman" is eliminated and until the laws permit greater control by the farmer over trespassers upon his land, little decrease in the number of posted farms may be expected.—Auth. abst.

13576. Hunter, Gilbert N. (*Colorado Game and Fish Dept., Denver.*) Methods of determining trends in big game numbers and range conditions. *Trans. North Amer. Wildlife Conf.* 10: 234-241. 1945.—Numbers of big game are important chiefly as they affect range and its carrying capacity for game and domestic stock. The Colorado Game and Fish Commission has developed a method of evaluating such herd-range relationships with 2 types of trend plots. Deer and elk are counted monthly throughout the winter on large (several sq. mi.) population trend plots. Counts are made from airplane, automobile and on foot. Smaller (100 X 100 ft.) range utilization plots are located within or adjacent to the population trend plots, and on these small areas the degree of utilization of 4-6 primary or secondary forage plants is recorded at the end of each grazing season. Boundaries of trend plots are constant from yr. to yr. The author describes 4 degrees of browsing: 1) Light: Generally, only the most convenient parts of the choicest plants are eaten. Seed stalks of primary browse plants are abundant and most young plants are intact. Low value plants are untouched. 2) Proper: The range is uniformly utilized with about 50% of the annual shrub growth being taken. Some seed stalks of primary plants are left and some young plants of primary plants remain. Low value plants are only slightly used. 3) Severe: Range has mown or hedged appearance. All the current growth of primary forage plants has been removed. Only occasional seed stalks and young plants of primary species remain. Low value plants are carrying most of the grazing load. 4) Destructive: Range appears grubbed rather than grazed, and definite browse line is evident. Primary plants are dead or dying. Even low value plants are closely cropped. Population counts and utilization measurements, taken together, clearly indicate the carrying capacity of the range and trends toward over-population and over-grazing thus become evident in time for management measures to be applied.—P. J. Moore.

13577. Jensen, H. Nilas. Sagittaria knolde som Andeføde. [*Sagittaria tubers as duck food.*] *Bot. Tidsskr.* 48 (1): 105. 1946.—In the stomach of a north-Scandinavian species of duck, *Sagittaria* tubers consumed as food during the migration through Denmark were found.—J. B. Hansen.

13578. Ligon, J. Stokley. Upland game bird restoration through trapping and transplanting. *Univ. New Mexico Publ. Biol.* 2. 1-77. 20 pl., 5 fig. 1946.—In the West, especially, the transplanting of upland game birds to reduce local over-populations and to restock depleted environments is a phase of wildlife management that recently has received much stimulus. Out of the author's own rich experience in this field he reports his conclusions. Attention is given to range requirements of game birds, emphasis being placed upon quail, sage grouse, sharp-tailed, pinnated and woodland grouse, wild turkey, ring-neck pheasant, and Hungarian partridge. Detailed consideration is given to the kinds of operating equipment needed, but the major emphasis of the volume is upon trapping techniques for the species named.

Finally, the care of captive birds and methods of releasing captured birds is covered.—E. F. Castetter.

13579. Llewellyn, Leonard M., and C. O. Handley. (Virginia Coop. Wildlife Res. Unit, Blacksburg.) The cottontail rabbits of Virginia. *Jour. Mammal.* 26(4): 379-390. 2 maps. 1945.—An important game animal in Virginia is the cottontail rabbit (*Sylvilagus*); approx. a million animals are killed yearly. The natural distribution of cottontails in Virginia has yet been little disturbed by artificial stocking. It is recommended that in restocking depleted areas, artificial transplantation of game be within the normal range of the species. *S. palustris*, *S. transitionalis*, and *S. floridanus* are the spp. found in the State. Three subsp. of the latter occur: *S. f. mallurus*, *S. f. mearnsi*, and *S. f. hutchensi*. *S. f. mearnsi* is reported for the first time. The 5 races are discussed as to range and habitat, and physical characteristics are compared. The height of the breeding season is in Mar. and Apr. Although ♂♂ were taken in preponderance over ♀♀ during Feb. and Mar., the ratio was reversed during Apr. and May. Practically all rabbits collected were infested with fleas (*Cediopsylla simplex*, *Odontopsyllus multipinosus*, and *Ctenocephalides canis*); and all except winter specimens had ticks (*Haemaphysalis leporis-palustris* and *Ixodes dentatus*). The rabbit is an important host for the common chigger (*Entombicula alfredeugesi*) and the mite (*Trombiculus microti*), and practically every specimen was infested by tapeworm (*Taenia pisiformis*). Some were infested with warble fly (*Cuterebra*), nematodes (*Dirofilaria scaphiceps*, *Obeliscoides cuniculi*, and *Dermatoxys veligera*), trematode (*Hasstilesia tricolor*), whipworm (*Trichurus leporis*), and coccidia. While tularemia was not found in the cottontail, the rabbit tick (*Haemaphysalis leporis-palustris*) collected from freshly-killed specimens proved a common carrier. This tick also carried Rocky Mt. spotted fever and American Q fever. Legislation prohibits sale of rabbits in Virginia, whatever the means of taking. Hunting is prohibited until Nov. 20 for licensed hunters, but landowners and tenants may hunt at any time. It is recommended that as a public health measure, the taking of cottontails be prohibited to all until Nov. 20.—N. E. Bell.

13580. Munro, J. A. (Okanagan Landing, B. C.) Observations of birds and mammals in Central British Columbia. *Ocas. Papers Brit. Columbia Prov. Museum* 6. 1-165. 1 map, 12 pl. 1947.—A preliminary investigation principally to evaluate the migratory game bird resources of the region, but providing considerable data of more general interest. The bulk of the publication consists of generously annotated lists of the birds and mammals. Detailed descriptions of the habitats in various typical areas are also given. Waterfowl are discussed in some detail as are the animals and plants representing their food potential. Migration and distribution notes for other birds, however, are not neglected. Discussions of life histories, kill records, cycles, and economic values include many mammals, but are most complete for the fur and game species. A chapter is devoted to the trapping and fur farming industries.—G. C. Carl.

13581. Read, Ralph A. White-tailed deer. A forest crop in the Arkansas Ozarks. *Southern Lumberman* 173 (2177): 141-142. 2 fig. 1946.—In 1925, two game refuges were established in the Sylamore District of the Ozark Natl. Forest. Only 25 deer were known to inhabit the forest at that time; in 1946 the number was estimated to be between 2 and 8 thousand. A cooperative effort has been started to study the deer diet and browse utilization, and the effect of heavy browsing on range condition and timber production. Procedures and limited preliminary observations are given.—T. C. Scheffer.

13582. Sekera, Jiří. Československo loveckou komorou Evropy. [Czechoslovakia, Europe's hunting district.] [With Eng. and Russ. summ.] *Věstník Česk. Akad. Zem.* 20(5/6): 219-223. 3 fig. 1946.—Czechoslovakia, due to its geographical position in central Europe, offers suitable habitat not only for deer but also for partridges, hares and pheasants. Yearly game kill totals in Czechoslovakia are: 2,400,000 partridges, 1,500,000 hares, 430,000 pheasants, 210,000 rabbits, 51,000 deer, 38,000 ducks, 19,000 woodpigeons, 7,100 grouse (moor-fowls), 6,500 stags, 3,700 snipes (woodcocks), 1,900 fallow deer, 1,100 mountain-cocks (wood-grouse), and many hundreds of various other game birds and mammals. Animal density of partridges, hares and pheasants is closely correlated with soil quality and the intensity of cultivation; the more intensive the cultivation, the higher the animal density. Maps of six Czech partridge, hare and pheasant production areas in Czechoslovakia are provided. The best partridge areas produce 2-3 birds per hectare (2.47 acres), and the best hare areas produce 1 hare per 2 ha.—Antonín Němec.

13583. Weaver, Richard L. (Audubon Nature Center, Greenwich, Conn.) Conservation workshops. *Metropolitan Detroit Sci. Rev.* 7(3): 20-22. 1947.—A successful conservation workshop was held in Greenwich, Conn., an Audubon Nature Center, in the summer of 1946. Specialized consultants on conservation and professional educators cooperatively worked out individual pertinent conservation problem projects. These natural resource specialists indoctrinated teachers in service with the necessity of workable conservation programs in the schools. Detailed list of projects and of states already carrying on conservation studies merits attention.—Sister Rose Angela Mayer.

13584. Young, Stanley P. Sketches of American wildlife. 143p. 47 fig. Monumental Press: Baltimore, Md., 1946.—Each of the 12 chapters is an essay in popular style about a wildlife subject with which the author has had extensive experience. Included are chapters on: the extension of range of the coyote eastward and into Alaska, including establishment of isolated populations in several eastern states; the history, habits and status of the black-footed ferret; the introduction of musk-oxen into Alaska; the comeback of the antelope in the western states; the early history of wolf control in America; the use of catnip as a lure for mountain lions and bobcats in trapping and photography; prairie-dog habits and economic importance.—Gustav Swanson.



# BIOLOGICAL ABSTRACTS

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## GENERAL BIOLOGY

Editors: A. H. GRAVES, *Plant*; C. A. KOFOID, *Animal*

(See also Entries 17035, 17920, 18384)

### INSTITUTIONS, ADMINISTRATION

16233. Blackburn, B. C. (*Gladstone, N. J.*) The botanical garden at Nikko [Japan]. *Jour. New York Bot. Gard.* 48(565): 1-11. 3 fig. 1947.—In addition to a physical description and history of the Nikko Bot. Garden, a descriptive list of nearly 50 plants, considered by the author as "of special interest," is printed.—C. H. Woodward.

16234. Various Authors. *Åaresberetning 1943-44*. [Annual report.] *Bergens Mus. Åaresberet.* 1943-44: 1-84. 4 fig. 1944.—This includes the Director's annual report, reports from various departments of the museum, financial statements, and a list of publications.

16235. Various Authors. *Åaresberetning 1944-45*. [Annual report.] *Bergens Mus. Åaresberet.* 1944-45: 1-91. 2 maps, 7 fig. 1945.—This includes the Director's annual report, reports from various departments of the museum, financial reports, and tributes to various individuals.

### MISCELLANEOUS

16236. Andrews, Edmund. A history of scientific English. The story of its evolution based on a study of biomedical terminology. [With a foreword by Arno B. Luckhardt.] 342p. Illus. Richard R. Smith: New York, 1947. Pr. \$7.50.—The methods and findings of comparative philology are here applied so as to give the reader an understanding of the origin of the words in the biological and medical terminology. Chapter II, Indo-European Philology, and III, Semantics: the Science of Meanings, afford a concise introduction to the principles of philology, with illustrative examples drawn largely from medical terms. The remaining chapters trace in chronological order the sources of our biomedical vocabulary, from pre-Hellenic influences and the Aryan heritage, through Greek, Latin, dead Latin, Arabic, French, Anglo-Saxon, and Middle and Modern English up to the present. There is a special chapter "Science vs. Vulgarly" which traces the changes in meaning by which formerly accepted terms acquired connotations of obscenity, or vulgarisms became respectable. 80% of English scientific words have a Latin element, while 75% of present-day medical English is based on the Greek of the Alexandrian schools. Greek words became so at home in Latin, because the Romans had no real science of their own, that adjectives were freely coined from them by the use of Latin endings, and these Latinized forms reached English, either through French, or through scholarly study of "dead Latin". Recent words coined from Greek roots are pronounced as if they also had come through Latin. For medicine, the Renaissance does not date from the 14th century, but from 1070 when Constantine Africanus arrived in the monastery of Monte Cassino near Naples, bringing Arabic manuscripts which he started to translate into Latin. Latinized forms were used for Arabic words which could not be translated because no Latin word for the concept existed. Thus science today is based on Latinity. German is treated separately. The number of Latin words which had been taken over by German before the great migrations is not usually realized because they were subsequently modified in the usual German man-

ner. For example, Latin "discus" became "disc" in Saxon and Gothic, and finally "dish" in English and "Tisch" in German. Modern German, by insisting on syllable by syllable translation of classic terms, has cut itself off from the Latinized scientific vocabulary which is otherwise international. The number of German loan words to English is practically nil, only 48 such words being listed in Skeat's "Etymological Dictionary." The last chapter suggests that the history of medical words should be studied by the method used in the "Oxford Dictionary", having volunteers read every scrap of known medieval and classical literature on medicine and note the words used. Modern biological nomenclature is severely criticized, and is contrasted with the structural clarity of the naming of compounds in chemistry.

16237. Apolinar Maria, Hermano. *Vocabulario de terminos vulgares en historia natural Colombiana*. *Rev. Acad. Colombiana Cienc. Exactas, Fis. y Nat.* 6: 467-483. 1946.—In continuation of this series, the present paper includes under their Spanish or native names botanical and zoological entries from 1960, Centella to 2135, Cocuyo. The scientific identity of each is given, with accompanying pertinent discussion. There is a footnote giving a letter by A. Dugand concerning *Bombax ceiba*, and also a short bibliography.—F. W. Pennell.

16238. Bernheim, Bertram M. A surgeon's domain. 253p. W. W. Norton and Co., Inc.: New York, N. Y., 1947. Pr. \$3.—An individual, personal mixture of autobiographical narrative and opinion on medical-social issues. Under the 1st heading, the book relates the author's experiences in research, and as surgical chief of a hospital, and reminiscences of Cushing, Welch, and Finney; under the 2d come opinions and suggestions concerning the training of internes and residents; state, group, and insurance medicine; fee-splitting; Negro physicians and medical students; the nursing shortage; and the conservative effect on surgery of advances in internal medicine and physiology.—W. F. Hewitt, Jr.

16239. Chester, K. Starr. (*Oklahoma A. and M. College, Stillwater*.) National requirement and availability of botanists. *Amer. Jour. Bot.* 34(4): 240-243. 1947.—Personnel surveys of botanists and plant pathologists show a present deficit of about 33% which is expected to be reduced to a deficit of about 17-20% by 1950. Most botanists are required for teaching, pathologists for research. The greatest need of botanists is for those trained in general botany and plant physiology. The deficit is greatest in southern, prairie, and mountain states.—K. S. Chester.

16240. Hsia, David Yi-Yung. A student looks at medicine in China today. *Nation. Reconstruction Jour.* 7(3): 58. 1947.—China is fundamentally poor, and the war has merely made things worse. It is said that in all China, there are only 6 competently trained pathologists. In the interior, the situation is even worse. Altogether, there are listed some 8,000-9,000 so-called modernly trained physicians in China today. Of this number probably 1,000-1,500 can be classified as really properly trained and possibly a few hundred of these, mostly graduates of Peking Union Med. College, can be considered up to American standards. The tremen-

dous influence of one good school like the Peking Union Med. College with only 250 alumni altogether can be demonstrated by the fact that in most of the technical posts where real work is accomplished in medicine, you will find PUMC men. The 2d shortage is that of equipment. Schools teaching medicine have no textbooks and laboratory equipment and most of the teaching is done by professors lecturing on what they know and the students taking and learning the notes. The 3d shortage is that of funds. Too many of the executives, men with the technical ability and administrative talent, waste their precious time just begging for funds. Yet, a lot of good medical work is going on in China today. The civilian medical work is carried forward by the National Health Administration. The military medical work is carried on by the Army Medical Administration. This group, although covering a small proportion of the population is just as large and well-organized as the National Health Administration because of the large group of PUMC people working in it. The 3d major group is made up of the medical schools and their hospitals. These are theoretically under the Ministry of Education, but, actually, each school is independent and each in spite of limited funds and lack of government backing is making a very substantial contribution to medical progress in China. Officially, there are some 30-odd medical colleges and schools listed. Of these, only 10 or 11 can be considered to be giving adequate medical training and only 4 may be considered first rate. PUMC, the only school giving training equivalent to American standards before the war, closed down after Pearl Harbor and so China is left today with no institution giving training equal to that given in Western schools. During the war, the majority of these 30-odd schools was forced to move inland and in the evacuation much of their valued equipment and books were lost. Now, most of the schools have returned to their original campuses, but they possess only what they brought back with them from western China. Virtually no new supplies have arrived from abroad since V-J day. The lack of books and equipment is hardest on the Pre-Medical and Pre-Clinical students. None of the students owns textbooks and the few copies available in the libraries are kept in glass cases to be used only for reference work. Laboratory work is now largely limited to demonstrations, with the result that a new generation is being developed who have virtually no experience in the laboratory. During the war, all courses were limited to 6 yrs., including the year of internship. Thus, only 1½ yrs. instead of 4 yrs. of Pre-Medical and 1½ yrs. instead of 2 yrs. of Pre-Clinical work as compared with the schools in the U. S. Instructors and students alike feel the course is inadequate for proper medical training. The government has helped by nationalizing the medical schools and paying for the food, lodging, and fees of all the students. Due to the pressure of their work and the sufferings they have had to undergo, many are not strong physically. During the war, and even today, the government endeavored to train large numbers of "lower level" doctors. These people are to be taken into training after their graduation from Junior Middle School and given a 3- to 6-yr. course in medicine. They are permitted to practice, but are not to

be given a University degree. These programs are handicapped by the lack of faculty, the lack of funds, and the extreme youth of the students, who at the age of 15 cannot be expected to take medical work seriously. The National Vaccine and Serum Institute is most efficiently run. They are now building new laboratories near the Temple of Heaven in Peiping. Due to their work, China is now largely self-sufficient in vaccines against most infectious diseases. In fact, the serums they produce are better adapted for use in China than those produced abroad. They have also recently erected a Penicillin Laboratory in Peiping which will produce approx. 1/4 of China's needs. The Army Medical Administration amounted to very little until it was taken over by 2 of China's ablest men, Lieut. Gen. Richard Loo and Lieut. Gen. Robert Lim. Dr. Lim left a professorship of Physiology at PUMC to organize the Red Cross field work. When in 1945, he was appointed to be Surgeon General of the Chinese Army, the Army Medical Administration immediately became one of the best run organizations in China. The AMA is creating a chain of model army base hospitals. A blood bank, a new Pyrogen-Free Water Plant which will provide all China with intraven. infusion material, the Army Medical College, the Army Nursing School, the Army Scientific Laboratories. Private practitioners are extremely varied in their skill and in the fees they charge. In Shanghai and Tientsin, there are a few doctors who, trained abroad, give excellent service to their patients. However, they charge enormous fees. In China, the private practitioners have lost the battle and socialized medicine is a foregone conclusion.—H. Necheles.

16241. Nathanson, Jerome. (Edited by.) *Science for democracy*. 170p. King's Crown Press: New York, N. Y., 1946. Pr. \$2.50.—Proceedings of the third annual Conference on the Scientific Spirit and Democratic Faith (New York, May, 1945). Contents: Introduction, by Jerome Nathanson; a symposium on Science in the National Economy: Science and human welfare, by Paul B. Sears; The scientific spirit and economic dogmatism, by Jerome Frank; and The gentlemen talk of science, by Robert S. Lynd; a symposium, The Challenge of Science to Social Thinking: Freedom and abundance, by Kirtley F. Mather; Psychiatry comes of age, by John A. P. Millet; and Challenge and response, by Gerald Wendt; and two group discussions: Does Private Industry Threaten Freedom of Scientific Research?, led by Arnold Dresden, and The Role of Science in the Determination of Democratic Policy, led by Sidney Hook. The following took part in the first discussion: Comfort A. Adams, Harry Grundfest, Abba Lerner, V. J. McGill, and Leo H. Rich; in the second, Felix S. Cohen, Dale De Witt, Max Grossman, Benjamin C. Gruenberg, Horace M. Kallen, William H. Kilpatrick, Eduard C. Lindeman, Ernest Nagel, Jerome Nathanson, F. S. C. Northrop, Morris Opler, R. Bruce Raup, W. F. G. Swann, V. T. Thayer, Adolph Tomars, and H. Van R. Wilson; and the following in both: the two leaders, A. S. Langdorp, Houston Peterson, Howard Putnam, Edwin H. Wilson, and Philip N. Youtz.—W. F. Hewitt, Jr.

## BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 16236, 16238, 16714, 16867, 17124, 17157, 17181, 17742, 18334)

### HISTORY

16242. Bertalanffy, L. v. *Botanik und Zoologie in Oesterreich. Aus der Geschichte der Naturwissenschaft. [Botany and zoology in Austria. From the history of natural science.] Universum* 1946(4): 79-84. 8 fig. 1945.—An historical survey of the development of biological sciences in Austria, with portraits of prominent scientists.—Max Onno.

16243. Dias, João de Deus de Oliveira. *Evolução da agricultura Brasileira. [History of Brazilian agriculture.] Bol. Sec. Agric., Indúst. e Comércio [Pernambuco]* 13(2): 98-125. 1946.—The account starts with the year 1500 and is brought down to date.—W. G. Houk.

16244. Ransom, John E. *(State Dept. Publ. Health, Atlanta, Ga.) The ambulance. Ciba Symposia* 8(11): 534-564. 1947.—A profusely illustrated history of the develop-

ment of the modern ambulance system. Chap. I. Service organizations for the relief of the sick and the wounded. This describes 3 great services: 1) The Knights Hospitallers of St. John of Jerusalem. This was organized during the 1st Crusade near the middle of the 11th Cent. Its hosp. was operating in Jerusalem in 1099 and in World War II 915 ♂♂ and ♀♀ were members of the St. John Ambulance Brigade and 364 were decorated for bravery or meritorious service. 2) The U. S. Sanitary Commission, started in 1861. The Commission developed and manned hospital ships and trains during the Civil War. 3) The Red Cross. Chap. II. Care of the sick and wounded in early wars. The customs of the Greek and Romans are reviewed and the methods during the Crusades, the Spanish Armada, the Amer. Revolution, etc. Chap. III is devoted to Baron Dominique Larrey

—father of ambulance service (1766-1844). Chap. IV. The development of ambulance service in the armies of Gt. Britain, the U. S. and other countries. Chap. V. Civilian ambulance service.

### BIBLIOGRAPHY

16245. *Advances in Genetics*. Volume I, 1947. Edited by: M. Demerec. Editorial Board: G. W. Beadle, William C. Boyd, Th. Dobzhansky, L. C. Dunn, Merle T. Jenkins, Jay L. Lush, Alfred Mirsky, H. J. Muller, J. T. Patterson, M. M. Rhoades, L. J. Stadler, and Curt Stern. 458 pages (11 articles) in the first volume. Published by the Academic Press, Inc., 125 East 23rd Street, New York 10, New York.—This series of volumes is to consist of critical reviews, summarizing outstanding recent contributions in genetics, and dealing with both theoretical and practical problems, and covering plant and animal breeding and human heredity, and also the related fields of biophysics, biochemistry, physiology, and immunology. Volume I contains the following articles (each to be abstracted separately): Cytogenetics and breeding of forage crops, by Sanford S. Atwood; Cytogenetics and speciation in *Crepis*, by Ernest B. Babcock; Speciation in fishes. Distribution in time and space of seven dominant multiple alleles in *Platyepiculus maculatus*, by Myron Gordon; Immunogenetics, by M. R. Irwin; The origin and evolution of maize, by Paul C. Mangelsdorf; The genetics of cattle, by Robert R. Shrode and Jay L. Lush; Recent advances in the genetics of *Paramecium* and *Euplotes*, by T. M. Sonneborn; Mutations in wild populations in *Drosophila*, by Warren P. Spencer; Types of polyploids: Their classification and significance, by G. Ledyard Stebbins, Jr.; and Cytogenetics of *Gossypium* and the problem of the origin of new world cottons, by S. G. Stephens.

16246. *Archivos del Instituto Nacional de Hidrologia y Climatologia Médicas*. Volume 1, Number 1, December 1946. Editors: Víctor Santamarina, Director; Gustavo Pittaluga, José C. Millás, Juan Embil, Jorge Brodermann, Jorge Guerra, Jesús F. de Albear, Armando Andreu, and Francisco Trelles. 58 pages (3 articles) in the first issue. Published by the Instituto Nacional de Hidrologia y Climatologia Médicas, Ministerio de Salubridad y Asistencia Social, Calle Infanta Esquina a Zaldo, Habana, Cuba.—The following papers comprise this issue: La fotolisis del hidrógeno sulfurado en las aguas de San Diego de los Baños (la comunicación), by Juan Embil; Un método cartográfico (determinación de Isohygias) para el estudio comparativo de las condiciones higiénicas de poblaciones humanas en distintos territorios, by G. Pittaluga; and Los nortes en La Habana, by José C. Millás.

16247. *Bibliographie der Schweizerischen Naturwissenschaftlichen und Geographischen Literature*. Volume 21, 1945 (1946). 260 pages. Published by the Verlag der Schweizer. Landesbibliothek, Bern, Switzerland.—This scientific bibliography is a continuation of the International Catalogue of Scientific Literature. It mentions publications printed or issued in Switzerland, publications written by Swiss authors abroad or by foreign authors living in Switzerland, and publications concerning Switzerland in the following branches of science: Mathematics, astronomy, physics, chemistry, crystallography, mineralogy, palaeontology, prehistory, ethnography and ethnology, anthropology, biology, bacteriology, botany, zoology, and geography. Issues may be obtained from the Swiss National Library, Bern, Switzerland.

16248. *Boletim da Inspeção Regional de Fomento da Produção Animal*. Volume 1, Number 1, October-December 1946. 47 pages. Published by the Ministério da Agricultura, Departamento Nacional da Produção Animal, Inspeção Regional em Belém, Estado do Pará, Brazil.—A bulletin intended to furnish information on animal production, feed, and foddors to the producers of the region. It includes no original research, but a number of short articles of popular type, and copies of official regulations and decrees.

16249. *Lobund Reports*. Number 1, November 1946. Editor: James A. Reyniers. Associate editors: Robert F. Ervin and Helmut A. Gordon. Irregular, 120 pages (2 articles) in the first issue. Published by the Univ. of Notre Dame, Notre Dame, Indiana. Subscription price \$1. (paper bound).—The Lobund Reports are primarily devoted to the publication of research in the fields of germ-free life,

micrurgy, and biological engineering. The following papers comprise this issue: Rearing germ-free albino rats, by James A. Reyniers, Philip C. Trexler, and Robert F. Ervin; and Germ-free life applied to nutrition studies, by James A. Reyniers.

16250. *Proceedings of the Egyptian Academy of Science*. Volume 1, 1945 (1946). Semi-annually, 6 articles (59 pages) in the first issue. Published by the Egyptian Academy of Sciences, "Dar el Hikma", 42, Qasr el Aini Street, Cairo, Egypt. Subscription price \$4.—The following papers comprise this issue: The zooxanthellae, morphological peculiarities and food and feeding habits of the Tridacnidae with reference to other lamellibranchs, by K. Mansour; The digestive enzymes of *Tridacna elongata* Lamk. and *Pinctada vulgaris* L., by J. J. Mansour-Bek; Reaction of *Citrus mycorrhiza* to manurial treatment, by Younis S. Sabet; *Hyoscyamus muticus* L. The effect of some environmental conditions on its growth and alkaloidal content, by Z. F. Ahmed; The nervous control of melanophores in the Egyptian chameleon (*Chamaeleo vulgaris* Daud.), by A. M. Farhaly; and Plant reactions to colchicine treatment, by Husein Said.

16251. *Revista de Nutrición*. Volume 1, Number 1, July 1946. Editor: J. A. Bedoya. 98 pages (4 articles) in the first issue. Published by the Instituto Nacional de Nutrición, Ministerio de Salud Pública y Asistencia Social, Av. Salaverry, Lima, Peru.—The following papers comprise this issue: El problema de la escasez de proteína animal en el Peru, by J. Almanzor Bedoya H.; El rendimiento muscular como medida relativa de energía y estado nutritivo, by J. Almanzor Bedoya H.; El poder nutritivo de los alimentos en relación a su precio, by J. Almanzor Bedoya H.; and Estudio químico-bacteriológico y nutritivo de algunos helados consumidos en la ciudad de Lima en el verano 1945, by J. Almanzor Bedoya H., Enrique Alvistur, Guillermo Feldmouth, Renán Urquieta, Eduardo Viñas, and Oscar Zumaeta S.

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16252. Briquet, John. *Biographies des botanistes à Genève de 1500 à 1931*. [Biographies of botanists at Geneva.] *Ber. Schweiz. bot. Ges.* 50A: 1-X. 1-494. 1 port. 1940.—This volume indicates in alphabetical order the names of 286 botanists who lived at least for some time in Geneva. Of each botanist the author gives some biographical notes with reference to the sources, a list of species and genera which had been dedicated to those botanists and finally a list of their publications. All in all, there are 3182 publications mentioned. The entire volume is a carefully treated book of reference for the history of botany.—S. Blumer and Anne Hasler.

16253. Browne, C. A. Andrew Lincoln Winton. *Jour. Assoc. Offic. Agric. Chem.* 30(1): 7-10. 1 pl. 1947.—A résumé of his life and works and the place that he occupied in the early work of the A.O.A.C. He was early associated with the Conn. Agric. Expt. Sta.; later he was with the Bureau of Chemistry; and after 1914 he conducted a private research and consulting laboratory. A list of his publications is given.—J. E. Webster.

16254. Corti, Alfredo. Marco De Marchi. Obituary. *Boll. Zool. [Turin]* 12(5/6): 207-213. 1 fig. 1941.

16255. Cotronei, G. Attilio Friggeri. Obituary. *Boll. Zool. [Turin]* 13(3/4): 115-116. 1 fig. 1942.

16256. Gal, M. le. L'Abbé Louis Grellet. *Rev. Mycol. [Paris]* 10(5/6): 65-68. 1945 (1947).—Obituary notice on the French specialist in Discomycetes, a pupil of Boudier.—E. J. Gilbert (trans.).

16257. Galgano, Mario. Willy Wolterstorff. Obituary. *Boll. Zool. Agar. e Bachicoltura [Turin]* 14(1/3): 125-126. 1943.

16258. Ghigi, Alessandro. Francesco Pio Pomini. Obituary. *Boll. Zool. [Turin]* 12(3/4): 153-156. 1 fig. 1941.

16259. Giacomini, V. In memoriam Ugolino Ugolini (1856-1942). *Nuovo Gior. Bot. Ital.* 51(1-4): 88-104. 1944.—Bibliographical notes on an Italian botanist, who lived at Brescia and founded there a small Exptl. Botanic Garden. A list of his publications is given.—Max Onno.

16260. Grassé, Pierre-P. (*Fac. Sci., Paris*). Octave Duboscq (1868-1943). *Arch. Zool. expél. et gén.* 84(1): 1-46. 1 pl. 1944.—Biographical note relating to life and scientific work of Octave Duboscq, Professor of Zoology at Montpellier, and director of the research laboratory of Ban-



ils-sur-Mer and Villefranche, and since 1924 one of the directors of the *Arch. de Zool. expér. et génér.* He is known for his investigations on the sexuality of Gregarinae, the discovery of the life-cycle of Aggregata and Porospora, as well as for many other works on Protozoa.—*Alb. Raignier.*

16261. Høeg, O. A. Mikael Heggelund Foslie. *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16A: 21-3. 2 fig. 1943.—Biography of the Norwegian algologist.—*A. Høeg.*

16262. Jepson, Willis Linn. (*U. California, Berkeley*.) Carl Purdy, lover of the lilies. *Jour. California Hort. Soc.* (1): 2-4. 1947.—Carl Purdy was born at Danville, Michigan, on March 16, 1861. He went with his parents to Nevada on an emigrant wagon train in 1865. Five yrs. later he went from Truckee Meadows to Ukiah Valley, California. When he was eighteen, he became a teacher in the public schools for three or four years, then a Wells Fargo agent, and then a court reporter. During his leisure, from boyhood on, he studied the native plants. A request for certain native plants was therefore passed onto him and was fulfilled so well that it was followed by other orders from many sources. His collecting trips took him over much of northern California. He also grew native plants and became an outstanding authority on the culture of many and on their taxonomic position. His most important scientific paper is *A Revision of the Genus Calochortus*. Much of his deep knowledge of *Lilium* is recorded in *Jour. Roy. Hort. Soc.* 26: 352-362. 1904. Articles of literary charm, on the flora of the Coast Ranges, appeared in *Garden and Forest*. He died on Aug. 3, 1945.—*M. L. Bowerman.*

16263. Klefbeck, Einar. G(ustaf) A(lfred) Ringselle [1868-1944]. *Ent. Tidskr.* 66(1/2): 65-67. 1945.—A short biography of this eminent Swedish entomologist. A portrait taken in 1936 is included.—*W. F. Rapp, Jr.*

16264. Mislavskii, A. N. Pamyati B. I. Lavrentieva. [In memory of B. I. Lavrentiev—obituary.] *Zhurnal Obshchei Biologii (Jour. Gen. Biol.)* 5(4): 199-204. 1944.—Review of the contributions of B. I. Lavrentiev with bibliography (53 references).—*Gerald Oster.*

16265. Pires de Lima, J. A. No limite de idade. [In the limit of age.] 105p. Portrait. Published by the Author: Porto, 1947.—This volume has been compiled in honor of the distinguished Portuguese anatomist and anthropologist J. A. Pires de Lima, on reaching his 70th year. It contains lists of the honors he received, the principal congresses in which he participated, and of his publications (344 titles).

16266. Reed, Howard S. (*U. California, Berkeley*.) Herbert John Webber. *Madroño* 8(6): 193-195. 1946.—Portrait as frontispiece of volume 8. Biographical sketch of the botanist who discovered motile antherozoids in *Zamia* and who later became director of the Univ. of California Citrus Expt. Station. He was influential in the development of genetics in America.—*A. M. Carter.*

16267. Roemer, Th. Professor Dr. Rudolf Freislebent. *Zeitschr. Pflanzenzücht.* 26(1/2): 163-164. 1944.—An obituary.

16268. Schädelin, W. Professor Dr. Ernst Münch. *Schweiz. Zeitschr. Forstw.* 97(12): 548-549. 1946.—Münch,

forester, professor of forest botany at Forstliche Hochschule Tharandt, and since 1933 at U. München, died Oct. 9, 1946.—*W. N. Sparhawk.*

16269. Schofield, M. A forgotten Russian pharmacist. The discoverer of ruthenium. *Pharmaceut. Jour.* 157(4322): 135. 1946.—Karl Karlovich Klaus (1796-1864) was born in Dorpat, Esthonia. In his early life while manager of a pharmacy at Saratov he studied the flora and fauna of the Volga steppes and later published a monumental work on the Volga flora. While at work on the steppes he became interested in mineral springs and chemistry. He sold his prosperous pharmacy and devoted his time to chemistry. Osmann, professor of chemistry at the U. Dorpat, in 1828, thought that he had discovered 3 new metals of the platinum group, but Berzelius doubted and almost denied their existence. Klaus decided to investigate platinum residues and eventually obtained ruthenium. Osmann's analyses were not correct but he blazed a trail for Klaus to follow and K. retained the name given by Osmann. Berzelius persuaded him to send a paper on ruthenium to the *Annalen*. A year before his death the Russian govt. sent him to study the refining of Pt in Paris and elsewhere.

16270. Schofield, M. Klaproth: pharmacist and famous analyst. *Pharmaceut. Jour.* 157(4337): 376. 1946.—A biographical sketch of Martin Heinrich Klaproth (1743-1817) the most eminent analyst and mineralogist of 18th Cent. Germany. He discovered uranium, titanium and zirconium and introduced tellurium and cerium to chemists. His great work entitled "Contributions to the chemical knowledge of mineral bodies (5 vols. 1796-1810) contains 207 dissertations on mineralogical chemistry. Klaproth worked as a pharmacist in the famous Rose Pharmacy of Berlin. He passed his exam. as an apothecary with distinction, presenting a thesis on phosphorus and distilled waters. Later he became "Assessor to the Supreme College of Medicine and Public Health," Berlin, and, when the Univ. of Berlin was established, its first professor of chemistry.

16271. Sparta, Antonio. Luigi Sanzo. Obituary. *Boll. Zool. [Turin]* 12(1/2): 79-80. 1941.

16272. Stout, A. B. Robert Almer Harper [1862-1946]. *Jour. New York Bot. Gard.* 47(563): 267-269. Portrait. 1946.—An obituary and review of the life and work of this distinguished botanist.

16273. Symmes, Mabel. Katherine Davies Jones, 1860-1943. *Madroño* 8(6): 184-187. 1946.—Biographical sketch and bibliography.

16274. Virville, Davy de. Léon Dufour. *Rev. Mycol. Suppl. [Paris]* 7(2): 54-55. 1942.—Biographical sketch of the French mycologist, who died Jan. 15, 1942, at the age of 80.—*E. K. Cash.*

16275. Anonymous. Don Ricardo E. Latcham Cartwright [1869-1943?]. *Bol. Mus. Nacion. Chile* 21: 5-8. Portrait. 1943.—An obituary and review of the life and work of this archaeologist and ethnologist, who emigrated from Bristol to Chile when very young, and worked all his life in Chile. He was the Director of the Museo Nacional de Historia Natural.

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 16306, 16309, 16313, 16314, 16328, 16332, 16349, 16729, 16859, 18509, 18517)

### GENERAL

16276. Guyer, M. F., and P. E. Claus. (*U. Wisconsin, Madison*.) Effects of urethane (ethyl carbamate) on mitosis. *Proc. Soc. Exptl. Biol. and Med.* 64(1): 3-5. 1947.—Intraperitoneal injns. of urethane ( $\text{NH}_2\text{COOC}_2\text{H}_5$ )—1 ml. of a 10% aqueous soln. per 100 g. of body wt.—almost wholly does away with all stages of mitosis for a period of 8-12 hrs., judging from counts of mitotic figures in sections of the corneal epithelium from rats and mice. Lung tumors of adenomatous type appeared in 75 of 86 animals treated with urethane. The connection between the interference of this drug with mitosis and its causation of lung tumors is not evident.—*M. F. Guyer.*

16277. Vanderlyn, Leon. (*Biol. Abstracts, U. Pennsylvania, Philadelphia*.) On the concepts of mitosis. *Science*

104(2709): 514-515. 1946.—An appraisal of several observations and theories of mitotic phenomena has led to the suggestion that the various forms which chromatin assumes, and the changes which it undergoes in the mitotic cycle, may be a shifting series of pathways along which transfers of energy and subst. are taking place between chromosomes and karyolymph and between nucleus and cytoplasm. The topography of the cell would thus be a visible reflection of its function as an energy transformer.—*H. M. Kaplan.*

16278. Zeiger, K. (*U. Hamburg, Germany*.) Neuere Anschauungen über den Feinbau des Protoplasmas. [New views on protoplasmic structure.] *Klin. Wochenschr.* 22: 201-205. 1943.—An extensive review of the molecular structure of protoplasm.—*J. Tripod.*

## PLANT

16279. Andersson, Enar. (*U. Lund, Sweden.*) A case of asynesis in *Picea abies*. *Hereditas* 33(3): 301-347. 34 fig. 1947.—The course of meiosis in an asyndetic spruce and in normal spruces has been studied. Except in the very earliest stages of division, chromosome pairing is exceedingly incomplete. During metaphase I bivalents occur in asyndetic spruce in 41% of cells, and the number of bivalents per cell varies between 1 and 8. Bivalents in these cells amount to 19.35% of the number possible. In all examined P.M.C.'s the frequency of bivalents is only 11.77% of the number possible. Of this frequency, 10.96% are rod bivalents and 0.81% ring bivalents. The chromosomes are distributed very irregularly to the poles during the first and second division. Premature centromere division occurs during anaphase I in 4.1% of the number of cells. During interkinesis the cells exhibit a varying number of nuclei. Restitution nuclei were found in 8.76% of the cells. At times, lagging chromosomes are eliminated during the 2d division, giving rise to micronuclei. The morphological pollen fertility is 2.6%. Some cells also show stickiness and aberrant division. This case of asynesis seems to be the only one so far observed in the Gymnosperms.—*Enar Andersson.*

16280. Atchison, Earlene. (*U. Virginia, Boyce.*) Chromosome numbers in the Myrtales. *Amer. Jour. Bot.* 34(3): 159-164. 29 fig. 1947.—Six genera of the subfamily Leptospermoideae, including *Angophora*, *Eucalyptus*, *Tristania*, *Backhousia*, *Leptospermum* and *Callistemon*, have  $2n = 22$ . This subfamily is principally confined to the Australasian region. Chief variations in chrom. no. are in the subfamily Myrtoideae; 4 genera, *Myrtus*, *Eugenia*, *Feijoa*, and *Psidium*, have diploid numbers ranging from 22 to 88. The distribution of the Myrtoideae is worldwide in tropical and subtemperate regions with the center of generic variation in tropical America. The combined evidence from studies of the geological record, geographical distribution and chrom. no. points toward an ancestral Myrtoideae in the western hemisphere, spreading worldwide during the Cretaceous and giving rise to a branch variation, the Leptospermoideae, before Australia was separated from Asia. The basic number for the Leptospermoideae is  $x = 11$ . There is evidence of a 7 series among the Myrtoideae, although 11 is the most frequent number. Chromosome number constancy in the family supports the designation of the Myrtales as a natural group.—*Earlene Atchison.*

16281. Castro, Duarte de, e F. Carvalho Fontes. (*Estação Agron. Nac., Portugal.*) Primeiro contacto citológico com a flora halófila dos salgados de Sacavém. *Brot. Ciênc. Nat.* 15(1): 38-46. 5 fig. 1946.—List of chromosome numbers of 24 spp. of plants in 9 families growing in saline soil at Sacavém in the Tejo estuary.—*E. K. Cash.*

16282. Dodds, K. S., and N. W. Simmons. A cytological basis of sterility in *Tripsacum laxum*. *Ann. Botany* 10(38): 109-116. 11 fig. 1946.—The chrom. no. of *T. laxum* (Guatemala gamagrass) was confirmed as  $2n = 72$ . Most chromosomes were associated as bivalents, but there were irregularities of association, congression, and separation resulting finally in ♂ sterility. Bridges were not seen at first anaphase; their occasional occurrence at 2d anaphase is interpreted as a consequence of chromatid fusion.—*Courtesy Expt. Sta. Rec.*

16283. Erlandsson, S. Chromosome studies of three *Alisma* species. *Svensk Bot. Tidskr.* 40(4): 427-435. 3 fig. 1946.—A cytological investigation of 3 *Alisma* spp. from Sweden, Finland and Denmark. Earlier phytogeographical investigations have shown that *A. lanceolatum* practically always occurs within the distr. area of *A. plantago-aquatica*. This condition is ascribed to the genetic relationship of these spp. To settle the question concerning their relationship and on account of the varying numbers of chromosomes obtained by different authors in *A. plantago-aquatica* ( $2n = 10, 12, 14$ ), chrom. nos. were detd. All material examined showed  $2n = 14$ . *A. lanceolatum* has  $2n = 28$ . The 2 spp. are very similar morphologically. The former sp. with the lower chrom. no. must be older than the latter. The small morphologic differences between them indicate that *A. lanceolatum* was derived from *A. plantago-aquatica* through doubling of the chromosomes. The spp. form a group parallel to *Empetrum nigrum* ( $2n = 26$ , a diclinal sp. with a southern distr.) and *E. hermaphroditum*

( $2n = 52$ , bisexual, northern distr.), though the types of distr. are different. In spite of small morphological differences between *A. plantago-aquatica* and *A. lanceolatum*, the latter must be considered as a separate species. In the 3d Scandinavian sp., *A. gramineum*, the chromosome number is  $2n = 14$ . The chromosomes are of the same type in all of the *Alisma* spp. discussed.—*H. Horn of Rantzen.*

16284. Esau, Katherine. (*U. California, Davis.*) A study of some sieve-tube inclusions. *Amer. Jour. Bot.* 34(4): 224-233. 55 fig. 1947.—This paper compares, with regard to origin and subsequent behavior, 2 kinds of sieve-tube inclusions, the slime bodies and the structures identified, in recent literature, as extruded nucleoli. The phloem material was obtained from 4 genera—*Vitis*, *Rubus*, *Gossypium*, and *Eucalyptus*. All 4 of these plants have slime bodies in differentiating sieve tubes, but only the latter 3 show extrusion of nucleoli. The slime bodies appear in the young sieve-tube protoplasts while the nuclei are still intact. Because of their plastic, semi-fluid consistency, the slime bodies assume different shapes. They are dense at first; later they become more diffuse, lose their sharp outlines and eventually disperse in the sieve-tube vacuole. The sieve-tube nuclei disintegrate while the slime bodies disperse. In *Vitis* no trace of the nucleus is left in the mature sieve-tube element. In *Rubus*, *Gossypium*, and *Eucalyptus* the nucleoli are extruded before the nucleus breaks down completely. The ejected nucleoli develop a characteristic sculpturing on the surface and remain within the sieve tube, apparently unchanged, as long as the latter remains intact.—*Katherine Esau.*

16285. Hagerup, O. (*Bot. Mus., Copenhagen, Denmark.*) On fertilisation, polyploidy and haploidy in *Orchis maculatus* L. sens. lat. *Dansk Bot. Ark.* 11(5): 1-26. 68 fig. 1944.—In individual fruits the fertilization of the many thousand ovules takes place in many different ways: most egg cells are fertilized in the normal way by one ♂ nucleus, the embryo thus being diploid. Often the 2 ♂ nuclei from a pollen tube adhere inseparably, both fertilizing the egg-cell and giving a triploid embryo. Very commonly, also, >1 pollen tube will penetrate into an ovule, probably resulting in higher degrees of polyploidy. Not rarely the ♀ sexual cell begins to divide without having been fertilized; if so, the embryo is haploid. This is called facultative parthenogenesis. Sometimes one of the synergids may form an embryo without fertilization. This will then most frequently be haploid and, if the egg cell has been fertilized, the twins will have different chromosome numbers ( $n$  and  $2n$ ). In the collective species *O. maculatus*, embryos with the following chrom. nos. normally develop: 20, 40, 60, 80, and possibly more. These have entirely different complements of genes, which must be of great importance for the development of new spp.—*O. Hagerup.*

16286. Langlet, O. (*Forest Res. Inst., Sweden, Stockholm.*) A handy field method of fixing root-tips. *Svensk Bot. Tidskr.* 40(4): 425-426. 1946.—The chromo-acetic-formalin fixing method of Karpechenko is modified. For fixing root-tips, 3 ml. vials are pre-filled with 1.8 ml. of soln. A (formalin, technical, 30 ml.; ethyl alcohol 10 ml.; dist. water 130 ml.). Soln. B ( $\text{CrO}_3$  1 g., glacial acetic 10 ml., dist. water 8 ml.) is added just before using (6-7 drops). Material can be left in this fixative indefinitely.—*H. Horn of Rantzen.*

16287. Litardière, René de. Nombres chromosomiques dans le genre *Echium* (Borraginaceae). [Chromosome numbers in the genus *Echium*.] *Boissiera* 7: 155-165. 1 fig. 1943.—Chromosome numbers are given for 22 spp. detd. by the author and by Strey (*Planta* 14: 718-728. 1931). 4 groups of spp. are distinguished: one group has  $2n = 14$  (*E. hispidissimum* only); the 2d group has  $2n = 16$  (majority of spp. and particularly *E. italicum*, which, therefore, must be separated from *E. hispidissimum*); the 3d has  $2n = 24$  (*E. rossicum*); the 4th has  $2n = 32$  (chiefly *E. rosulatum* and the tetraploid form of *E. vulgare*).—*B. P. G. Hochreutiner.*

16288. Löve, Askell, and Doris Löve. (*U. Lund, Sweden.*) Cyto-taxonomical studies on boreal plants. II. Some notes on the chromosome numbers of Juncaceae. *Arkiv Bot.* 31B(1): 1-6. 9 fig. 1944.—Materials used were collected in Lapland and Scania during 1942-43. All fixations were made in nature using the modification of Navashin's

ative used at Svalöv. Somatic chromosome numbers of 7 in each of *Luzula* and *Juncus* were counted. The count of each of the following *Luzula* spp. was found to be  $2n =$  *wahlenbergii*, *arcuata*, *campestris*, *multiflora* ssp. *occidentalis*, *multiflora* ssp. *frigida*, and *sudehica*. In *L. parviflora*,  $2n = 24$ . The count of the following *Juncus* spp. is  $2n =$  *effusus*, *alpinus* ssp. *fuscoater*, and *bulbosus*. In *J. humis*,  $2n = 50$ , in *J. trifidus*,  $2n = 30$ , in *J. arcticus*,  $2n =$  approx. 100, and in *J. filiformis*,  $2n =$  approx. 80.—*Sister Clare Metz.*

6289. Löve, Askell, and Doris Löve. Cyto-taxonomical dies on boreal plants. III. Some new chromosome numbers of Scandinavian plants. *Arkiv Bot.* 31A(12): 1-22. fig. 1944.—Material for these counts was collected mostly in Scania and Lapland and was fixed in nature using the fixation of Navashin's fixative used in Svalöv. The following counts were detd.: *Triglochin maritimum*  $2n =$  26, *Alisma lanceolata*  $2n =$  26, *Echinodorus ranunculoides*  $=$  16, *Sieglingia decumbens*  $2n =$  18, *Schlotheimia festucae*  $2n =$  28, *Glyceria fluitans*  $2n =$  28, *Festuca polesica*  $2n =$  28, *Bromus inermis*  $2n =$  approx. 56, *Agropyron latiglume*  $=$  28, *Hordeum murinum*  $2n =$  28, *Cyperus fuscus*  $2n =$  28, *Eriophorum brachyantherum*  $2n =$  58, *Schoenus ferriensis*  $2n =$  76, *Carex juncella*  $2n =$  74, *C. livida*  $2n =$  74, *Listera ovata* from Ostersund  $2n =$  34, from Riseberga  $=$  36, *Betula tortuosa*  $2n =$  56, *Sagina caespitosa*, exact number not detd., approx.  $>100$ , *Papaver dubium*  $2n =$  42, *Plotaxis muralis*  $2n =$  42, *Cardamine pratensis* s. lat. from Finia  $2n =$  32, from alpine area,  $2n =$  64, *Reseda luteola*  $=$  28, *Sedum acre*  $2n =$  approx. 48, *Astragalus frigidus*  $=$  16, *Geranium pusillum*  $2n =$  26, *Erodium cicutarium*  $=$  20, *Polygala vulgaris*  $2n =$  approx. 70, *Euphorbia ioscopia*  $2n =$  42, *Helianthemum nummularium*  $2n =$  20, *Motropa hypophygea*  $2n =$  16, *Trientalis europaea*  $2n =$  16, *Lithospermum arvense*  $2n =$  28, *Ajuga pyramidalis*  $2n =$  28, *Dracocephalum ruyschiana*  $2n =$  14, *Veronica alpina*  $=$  18, *Limosella aquatica*  $2n =$  40, *Pedicularis silvatica*  $=$  16, *P. lapponica*  $2n =$  16, *Pinguicula vulgaris*  $2n =$  64, *Alpina*  $2n =$  32, *Globularia vulgaris*  $2n =$  16, *Linnaea borealis*  $2n =$  approx. 32, *Scabiosa canescens*  $2n =$  16, *Gnaphalium norvegicum*  $2n =$  56, *Archium vulgare*  $2n =$  36, *Saussurea alpina*  $2n =$  54, *Lactuca alpina*  $2n =$  18. 112 additional counts were checked with hitherto published accounts.—*Sister Clare Metz.*

6290. Lövkvist, B. (Inst. Genetics, Lund, Sweden.) Chromosome studies in Cardamine. *Hereditas* 33(3): 421-424. 1947.—Cytological studies in the species complex *C. dentata* showed races with  $2n = 30, 56, 60, 64, 68,$  and 76. Plants with 58 and 84 chromosomes were also found. Plants of different races very often grow together in meadows, but the race with  $2n = 30$  grows only at higher elevations in the meadow, the races with  $2n = 56, 60, 64, 68$  at lower levels, and the races with  $2n = 72, 76$  near or in the forest.—*B. Lövkvist.*

6291. Stockar, A. Complemento cromosomico diploide algunas especies de "Aleurites". [Diploid chromosome number of some spp. of "Aleurites".] *Rev. Argentina bot.* 13: 253-255. 1946.—*Aleurites fordii*, *A. montana*, *cordata* and *A. trisperma* are reported with a diploid chromosome number of 22. The last sp. has been unreported previously. *A. moluccana* is a tetraploid with 44 chromosomes. Photomicrographs, measurements and technique are described or illustrated.—*S. W. Edgcombe.*

#### ANIMAL

6292. D'Angelo, Ethel Glancy. (Queens Coll., Flushing, N. Y.) Micrurgical studies on Chironomus salivary gland chromosomes. *Biol. Bull.* 90(1): 71-87. 5 fig. 1946.—The salivary gland chromosomes of mature *Chironomus* spp. were studied both within the intact cell and after their isolation into a Ca-free solution. (0.09 M KCl, 0.06 M Cl, 0.005 M Phosphate, pH 7). Puncture of the cell with a fine microneedle had little or no effect on the structural and physical properties of the chromosomes, whereas tearing the cell or gross puncture caused the chromosomes to shrink markedly and to become highly viscous. In order to maintain isolated chromosomes in the fresh state it was necessary to remove them at once, without contact with the torn cytoplasm, into the Ca-free medium. The chromosomes, either within the fresh cell or immediately after isolation, were

easily deformable, highly extensible and elastic. Maximal stretching of the chromosomes could not be accomplished without rupturing the nuclear membrane. Isolated chromosomes were stretched 12- to 25-fold before breaking and could regain their original length if stretching did not exceed 10-fold. Treatment with acids, osmium tetroxide and formalin caused the chromosomes to become stiff and inelastic; treatment with alkalis rendered them ductile. The following observations appeared to support best the polytene concept of chromosome structure: (1) the occasional appearance of fibrillae in the untreated cell, (2) the presence of fibrillae at the broken ends of stretched chromosomes, (3) the removal of longitudinal fibrillae from the chromosome by microdissection, (4) the shredding of chromosomes into numerous fibrillae by expulsion from a micropipette. Further experiments are described which indicate that the salivary gland chromosome possesses a delicate membrane, and that the chromosomes maintain their morphological integrity in nuclei hyalinized by hypotonic or mildly alkaline Ringer's solution.—*E. G. D'Angelo.*

16293. Galgano, Mario. (U. Florence, Italy.) La variazione nei chiasmi nei maschi e negli intersessuati di "Rana esculenta" L. [Chiasma variations in ♂ and intersexes of *R. esculenta*.] *Arch. Ital. Anat. e Embriol.* 46(2): 127-164. 26 fig. 1941.—Chiasma variations are divided into 4 groups: 1) Normal variations in spermatocytes: in 49% of these, the tetrads have 2 terminal chiasmata and 51% have 1 or, more rarely, 2-4 tetrads with 1 terminal chiasma only. It was again determined that the tetrad considered as a sex chromosome by Witschi and by many Japanese authors is a common tetrad with 1 terminal chiasma. 2) Variations in spermatocytes having a chromosome number in excess of normal: some multiple tetrads were observed and Darlington's interpretation is accepted. 3) Variations in the germ cells having intermediate sexuality: here the tetrads may be of the ♀ type (not shortened and with non-terminal chiasmata) or similar to the ♂ type (much shortened and with terminal chiasmata), or of an intermediate type; sometimes they show one of these ♂ characters together with one of the ♀ characters. These cells are probably formed by the presence in the same gonad of the 2 sex-differentiating substances which seem to have a more or less direct control over the tetrads. The formation of intersexual cells in the frogs studied is supposed to be due to an environmental factor, viz., high temperature during larval life. 4) Variations in germ cells under the action of cold: an average environmental temperature between 9° and 13°C may cause the occurrence of hemiheterotypic spermatocytes. Also the germ cells having intermediate sexuality and perhaps also the oocytes may show this process.—*M. A. Barbasetti.*

16294. Hall, R. P. (New York U., N. Y. C.) Cytoplasmic inclusions of the plant-like flagellates. II. *Bot. Rev.* 12(9): 515-520. 1946.—This is a supplement to a review of the same title which appeared in the *Bot. Rev.* 2: 85-94. 1936. Subjects discussed are: Golgi material, vacuome, mitochondria and subcuticular inclusions. The bibliography includes 19 citations.—*F. T. Addicott.*

16295. Hillarp, N.-Å., and H. Olivecrona. (Histol. Inst., Lund, Sweden.) Structural proteins and oriented lipids in the cytoplasm of secreting and resorbing epithelial cells. *Acta Anat. [Basel]* 2(2): 119-141. 1946.—Epithelial cells were examined from rat organs: stomach, intestine, kidney, pancreas, liver, submaxillary, sublingual, parotid and thyroid glands, choroid plexus, prostate, and seminal vesicles; and from uterus, Fallopian tube, and ovary of rabbits. The cells were examined with a polarizing microscope, some in the fresh state (in Locke's solution, glycerine, sucrose, and other liquids) and some after formalin fixation. To distinguish optical effects due to proteins from those due to lipids, some cells were subjected to lipid solvents (alcohol, ether, chloroform). Fiber-like strands demonstrated by the polarizing microscope were concluded to be of polypeptide composition because when heated to 80-90°C the cells (epithelium of intestinal villi) shortened and broadened. The authors conclude that in the ground cytoplasm of epithelium of intestine, seminal vesicle, prostate, uterus, and Fallopian tube, there exists a definite molecular arrangement with trabeculae running from base to apex and composed of polypeptide chains. They form an orientation structure for lipids, whose anisodiametric molecules are at right angles to



the trabeculae. A similar submicroscopic structure is possessed by certain cytoplasmic differentiations (e.g., basal filaments, brush border) in epithelia of pancreas, submandibular and sublingual glands, kidney, and intestine. It is not clear whether the ergastoplasm of pancreas cells is polypeptide or nucleic acid chains.—Donald Mainland.

16296. Koller, P. C. (*Roy. Cancer Hosp., London, Eng.*) Control of nucleic acid charge on the X-chromosome of the hamster. *Proc. Roy. Soc. Ser. B: Biol. Sci.* 133(872): 313-326. 7 fig. 1946.—When its nucleic acid charge is reduced, the differential segment of the X-chromosome of *Cricetus auratus* (golden hamster) appears as a thin, unspiralized, understained thread (starved cells). This occurs in conditions lowering spermatogenesis and is proportional to decrease in spermatogenesis. Summer level (breeding season) of starved cells varied from 10% at age 6 months to 30% at age 24 months. Winter level of starved cells varied from 50% at age 6 months to 70% at age 24 months. With 17 to 119 days deficient diet, summer level of starved cells increased to 50 to 85%. In 3 cases of disease (scabies, liver pathology, general debility), summer level of starved cells ranged from 26 to 87%. Results are explained on the basis of deficient cytoplasmic stores of ribose nucleic acid.—E. H. Shaw, Jr.

16297. Kudo, R. R. (*U. Illinois, Urbana.*) *Pelomyxa carolinensis* Wilson. II. Nuclear division and plasmotomy. *Jour. Morph.* 80(1): 93-134. 9 pl. 1947.—The nuclei of *P. carolinensis* are vesicular discs. Each is composed of a membrane and of nucleoplasm in which are suspended large peripheral achromatin granules and centrally distributed minute chromatin granules and filaments. The division of the nuclei is simultaneous and the process is synchronous. The nuclear division is mitotic and is characterized by the disappearance of the membrane and the appearance of spindle fibers and chromosomes. The peripheral achromatin granules contribute toward the formation of the spindle fibers which are at first parallel to one another. In anaphase, however, the polar fibers converge to a narrowed area. The chromatin material represented by granules and filaments becomes enlarged and intensely Feulgen-positive. The chromosomes are roughly spherical bodies about 1  $\mu$  in diameter and number some 100. The metaphase is of a very short duration. Telophase nuclei are triangular in form. As the chromatin granules and filaments become increasingly inconspicuous, the peripheral granules increase gradually in both size and number. Thus, resting nuclei are formed. There is a definite correlation between the phases of nuclear division and the appearance of the organisms. Pseudopods are retracted and the body contracts during prophase; at metaphase and early anaphase numerous globular pseudopods cover the entire body-surface. Nuclear division and plasmotomy occur in organisms of all dimensions. Plasmotomy results in the production of from 2 to 6 daughter individuals.—Auth. (courtesy Wistar Bibl. Serv.).

16298. Schreiber, Giorgio. (*Inst. Butantan, São Paulo, Brazil.*) Pesquisas de citologia quantitativa: O crescimento interfásico dos espermatogônias nos ofídios. [Researches in quantitative cytology: Interphase growth of the spermatogonia of the snakes.] *Rev. Brasil Biol.* 6(2): 199-209. 3 fig. 1946.—The volumes of the nuclei of spermatogonia, 1st and 2d spermatocytes, and spermatids were calculated from modal diameter measures in 8 spp. of snakes, *Crotalus t. terrificus*, *Bothrops jararaca*, *Driophylax pallidus*, *Xenodon merremi*, *Pseudoboa trigemina*, *Philodryas schottii*, *P. olfersii*,

and *Tomodon dorsatus*. The nuclear volumes, in all except the spermatogonia, were strictly correlated with multiples of the genom present. In the spermatogonia a transitory triploid stage is suggested since the volume corresponding to 1½ times the diploid is observed. The gonial prophase corresponds with the nuclear size expected in tetraploid cells. Alternative interpretations for the origin of this sesquiphase are suggested.—J. L. Carledge.

16299. Slizynska, Helen, and B. M. Slizynski. Genetical and cytological studies of lethals induced by chemical treatment in *Drosophila melanogaster*. *Proc. Roy. Soc. Edinburgh* 62B(Pt. 3, paper no. 28): 234-241. 1946.—In a total of 89 sex-linked recessive lethals chemically produced in *D. melanogaster*, there were 6 gross structural changes, of which 3 had a detectable deficiency (5, 12, 15 bands) at one breaking point, and 16 deficiencies without gross structural changes. About 20% of the chemically produced lethals are connected with deficiencies detectable in salivary gland chromosomes. This proportion is almost exactly the same as that previously found for spontaneous lethals and for X-ray and u.v. induced lethals, whereas the proportion of gross structural changes among lethals shows great variations depending upon the agent employed. Among the chemically produced deficiencies there are 2 distinct groups: small deficiencies not exceeding 3 bands and large deficiencies. The former are by far the more numerous. The distribution of the 83 lethals studied is similar to the distribution of 114 "visible" mutants taken from Bridges' and Brehme's book. The statistical analysis of the distribution of lethals and/or "visible" loci in the whole chromosome shows that at the free end of the X-chromosome there is an enormous accumulation of detectable loci per unit of genetical length. As to the nature of the distribution of loci in the main body of the chromosome there are some indications of a certain amount of clustering.—B. M. Slizynski.

16300. White, M. J. D. (*Univ. Coll., London, Eng.*) The cytology of the Cecidomyiidae (Diptera). III. The spermatogenesis of *Taxomyia taxi*. *Jour. Morph.* 80(1): 1-22. 2 pl., 10 fig. 1947.—*T. taxi* has a decaploid germ line in the ♂ and probably also in the ♀ (40 chromosomes in the spermatogonia and approx. the same number in the oogonia). One diploid set of chromosomes is heteropycnotic in resting spermatogonia and oogonia. The somatic nuclei of both ♂ and ♀ are diploid, containing 8 chromosomes. The polytene salivary gland nuclei show 4 large double elements, which are quite free, there being no chromocenter. It is probable that 32 chromosomes (8 sets) are eliminated from the somatic nuclei during the cleavage divisions, but this elimination has not been actually observed. No sex chromosomes have been detected at any stage. The meiotic divisions follow essentially the same course as in *Miastor*, previously described, 2 haploid sperms and a 9-ploid cell being produced from each spermatocyte. During the prophase of the first meiotic division a group of 8 chromosomes are heteropycnotic, as in the spermatogonial divisions. Four of these are pushed out on a unipolar spindle at the 1st meiotic division, which also involves an unequal partition of the cytoplasm. The 2d meiotic division, which only occurs in the haploid cells and not in the 9-ploid ones, is a normal mitosis. The chromosome cycle of *Taxomyia* is compared with those of the other Cecidomyiidae that have been studied cytologically (*Miastor*, *Oligarces*, *Phytophaga*). The cytological mechanisms are probably rather uniform throughout the family.—Auth. (courtesy Wistar Bibl. Serv.).

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 16279, 16283, 16285, 16290, 16291, 16302, 16327, 16384, 16582, 16740, 16783, 16801, 16883, 16987, 17038, 17279, 17445, 17451, 17465, 17468, 17473, 17475, 17482, 17503, 17648, 17809, 17814, 17873, 17934, 17976, 18030, 18039, 18041, 18109, 18112, 18129, 18132, 18155, 18165, 18166, 18179, 18220, 18223, 18247, 18316, 18516, 18517, 18597, 18598)

### GENERAL

16301. Auerbach, C., J. M. Robson, and J. G. Carr. (*U. Edinburgh, Scotland.*) The chemical production of mutations. *Science* 105(2723): 243-247. 1947.—Chem. substances with mutagenic properties are useful tools for attacking the problem of mutation. Mustard gas is an effective

mutagen which produces chromosome breaks and rearrangements. Mustard gas is not as indiscriminate in its bodily effects as are roentgen rays, and the diff. in effects may be ascribed to the diff. amts. of energy involved in the 2 types of reaction. Only 3 substs., belonging to the class of N- or S-mustards, have been found whose genetic effects are

similar to those of mustard gas. A certain proportion of natural mutations may be caused by the action of mutagenic substs. within the organism.—*H. M. Kaplan.*

16302. Kříženecký, J. (*Animal Breed. and Genetics Res. Inst., Brno, Czechoslovakia.*) Obecné vzorce pro výpočet počtu možných kombinací a různých druhů genotypů při polyhybridismu při libovolných genotypech rodičů. [General lesgas for the calculation of a possible number of combinations and for various forms of genotypes with polyhybridism of arbitrary genotypes of parents.] [In Czech with German.] *Sbor. Česke Akad. Zem.* 17: 425-432. 1942.

#### PLANT

16303. Bolsunov, I. Zur Untersuchung der Heterosis bei *Nicotiana rustica* L. V. Fortgesetzte Selbstbefruchtung und Ernteertrag. *Zeitschr. Pflanzenzücht.* 26(3/4): 223-244. 3 fig. 1944.—It was claimed by Lysenko that continued self-fertilization of plants has harmful effects, and the breeding technic of autogamous plants such as wheat was reformed on this basis. In expts. on *N. rustica* the author refuted Lysenko's claims. Continued self-fertilization did not cause any degeneration, and preliminary expts. did not indicate any improvements from crosses between strains of the same ort. The heterosis obtained by crossing different sorts does not increase if the sorts have been inbred for a number of generations. The adaptation of many autogamous spp. to occasional cross-fertilizations increases the genetic adaptability of the spp. by allowing gene recombinations.—*G. Östergren.*

16304. Charetschko-Sawizkaja, H. Selbststerilität und Selbstfertilität bei *Beta vulgaris* L. *Zeitschr. Pflanzenzücht.* 6(1/2): 103-118. 10 fig. 1944.—The cause of self-sterility in *Beta* cannot be protandry, as the pistil is already functional in a closed buds. There is normally plenty of pollen shed on the stigma of the same flower, and such pollen is well able to germinate there, although the germination is slightly delayed as compared with cross-pollination. The rate of pollen-tube growth is, however, much slower after self-pollination, and the tubes ordinarily do not penetrate the style during the fertile period. The few cases of self-fertilization are often followed by degeneration after a variable degree of development of the zygote. Such embryo degeneration is regarded as the earliest and most extreme variant of the general phenomenon of inbreeding degeneration. Some strains of *Beta* showing a variable degree of self-fertility (up to 100%) were also studied. The rate of pollen-tube growth in them is largely parallel to the % seed fertilization. Good pollen-tube growth and good ability of development of the zygotes may exist independently, but they must both be present in highly self-fertile strains. A simplified method of estimating the frequency of fertilization (by morphological characteristics instead of embryological ones) is suggested, as well as methods of estimating the formation of normal seeds.—*G. Östergren.*

16305. Charetschko-Sawizkaja, H. Selektive Befruchtung. *Zeitschr. Pflanzenzücht.* 26(3/4): 187-198. 1944.—The view of Lysenko that autotetraploid forms and autogamous spp. always will prefer pollen of other individuals for fertilization when available, and his idea that such pollen is selected as will give progeny of maximum viability, are both improved. Plants from self-fertile races of sugar beets (*Beta vulgaris*) were isolated together with plants from other beet races. In spite of the fact, that cross-fertilization gives considerably increased vigor to the progeny, most of the progeny from the self-fertile beets had originated from self-fertilization. Self-fertilization seems to be most common only in combination with other races but also within the self-fertile beet races. The literature on selective fertilization is reviewed and discussed in connection with Lysenko's views. The evolution of self-sterility in cross-fertilizing populations and related problems are also discussed.—*G. Östergren.*

16306. Einset, John. (*Agric. Expt. Sta., Geneva, N. Y.*) Neuploidy in relation to partial sterility in autotetraploid lettuce (*Lactuca sativa* L.). *Amer. Jour. Bot.* 34(3): 99-105. 1947.—Euploid plants of induced autotetraploid lettuce may be almost completely sterile to 50% fertile on natural selfing. Aneuploid plants lacking one chromosome or with 2 or 3 extra chromosomes over the euploid number were extremely sterile on natural selfing when compared to their euploid sibs. Cross-pollination did not significantly in-

crease the seed set of the euploid or aneuploid plants. The slight increase which was found after manual selfing or crossing was presumably a result of better pollination. The "fertile" euploids and "sterile" aneuploids were similar in vigor and appearance. No constant differences were observed in the frequency of undeveloped embryo sacs in euploids and aneuploids, nor was any significant difference found in the behavior of the chromosomes at microsporogenesis, nor in the amt. of aborted pollen, that would explain the differences in fertility. Euploid plants on natural selfing produced about 80% seedlings with the euploid number of 36 chromosomes and about 20% seedlings that were aneuploids, lacking 1 chromosome or with 1, 2 or 3 extra chromosomes. Aneuploids on natural selfing produced about 25% euploid plants and 75% aneuploids.—*John Einset.*

16307. Fries, N., and U. Trolle. (*U. Uppsala, Sweden.*) Combination experiments with mutant strains of *Ophiostoma multiannulatum*. *Hereditas* 33(3): 377-384. 1947.—In 14 of 37 illegitimate combinations of different physiological (uracil-, hypoxanthine-, adenine- and guanine-heterotrophic) mutants of *Ophiostoma multiannulatum* on malt-agar, a prototrophic (= "wild type") mycelium developed. This must have arisen through a segregation in rudiments of perithecia. Heterocaryotic hyphae could not be found in these combinations, nor in such combination cultures on agar containing a synthetic nutrient soln. In 13 of these 31 cases last mentioned, however, there was some growth, probably due to the formation of extracellular symbioses.—*N. Fries.*

16308. Granhall, I. On heterosis effects in *Triticum vulgare*. *Hereditas* 32(2): 287-293. 1946.—In 2 wheat crosses the author found the heterozygous half-bearded  $F_2$  plants averaging more vigorous than corresponding beardless and bearded groups. In the first case, 2 very different spring wheats—Hindi and Extra-Kolben II—were crossed; in the other, a winter wheat—Pansar—and its bearded mutant were used as parents. The findings provide strong indications of pleiotropic effects of the beardless factor or absolute linkage between this morphological factor and quantitative physiological genes. The 2d cross—where the parents differed only monofactorily—gives a clear demonstration of real heterosis stimulation. In the cross of 2 very different vars., the av. number of culms of the  $F_2$  plants failed to reach the mean of the 2 parents; in the other cross—where the parents differed in only a single factor (or factor complex)—the corresponding differences in vitality were numerically very small and quite insignificant, in accordance with expectations. As to plant height, the av. of  $F_2$  from the 1st cross was higher than the mean of the 2 parents. This is explained by assuming that one of the parents (Extra-Kolben II) includes some strongly dominant length factors, whereas the other parent (Hindi) has the recessive alleles.—*Courtesy Expt. Sta. Rec.*

16309. Gustafsson, A. The effect of heterozygosity on variability and vigour. *Hereditas* 32(2): 263-286. 1946.—The author reviews previous results along this line in plants and animals (22 references) and presents some further cases of monohybrid heterosis in barley. The series of data given are believed to show that mutations lethal in the homozygous condition may increase viability when they occur in the single dose. Vigor may also be affected in a general sense: In some plants the reproductive capacity is increased along with properties such as length of culm or head and ability to tiller. Heterozygous seeds of the barley mutation albina 7 kept their germinating capacity longer than the homozygous seeds; this was especially conspicuous in medium strong and strong plants. A tendency existed to increase the range of variation in mono- and di-hybrids as compared with the homozygous sister plants. Some of the problems on population dynamics and inbreeding degeneration are discussed briefly.—*Courtesy Expt. Sta. Rec.*

16310. Hendrix, J. Walter, K. Kikuta, and W. A. Frazier. (*Hawaii Agric. Expt. Sta., Honolulu.*) Breeding tomatoes for resistance to gray leaf spot in Hawaii. *Proc. Amer. Soc. Hort. Sci.* 47: 294-300. 1 fig. 1946.—The degree of resistance to defoliation by the gray leaf spot disease caused by *Stemphylium solani*, a serious disease of tomato in Hawaii, is described for progenies of 23 selections of known parentage, bred from hybrids of several origins, including *Lycopersicon esculentum*, *L. pimpinellifolium*, and other spp. Among them, 6 progenies were found to be 100% resistant, while others showed varying percentages of susceptibility. The

results are taken to give assurance that commercially acceptable types with respect to fruit size and other characteristics can be selected which are almost fully resistant to this disease.—W. B. Mack.

16311. Hjelmqvist, H. (U. Lund, Sweden.) Eine Periklinallchimäre in der Gattung *Syringa*. [A periclinical chimæra in the genus *Syringa*.] *Hereditas* 33(3): 367-376. 1947.—An old garden-form of *Syringa*, generally called *S. chinensis* v. *alba*, more correctly *S. correlata* A. Braun, often gives inflorescences, flowers or flower-sections of the typical *S. chinensis*. The leaves of the form are of the same shape as those of *S. chinensis*; the flowers are more reminiscent of *S. vulgaris* in the cucullate flower-lobes and the round incisions of the calyx; their color is pale lilac, especially pale, nearly white, in the lobes. Morph. and anatomical studies show that the epidermis agrees with *S. vulgaris*; under the epidermis the tissues of *S. correlata* agree with *S. chinensis*; the differences between these 2 forms and *S. vulgaris*, however, are not great. These facts seem to indicate that *S. correlata* is a haploclamydous chimæra, the inner component being *S. chinensis*, the outer probably a white *S. vulgaris*. It has probably arisen through grafting of *S. vulgaris* on *S. chinensis*.—H. Hjelmqvist.

16312. Hoffmann, Walther. Die Vererbung der Winter-Sommer-Form und der Winterfestigkeit der Gerste. *Zeitschr. Pflanzenzücht.* 26(1/2): 56-91. 15 fig. 1944.—Winter and summer types in cereals differ in response of rate of development to vernalization and short day treatment. A similar state of affairs holds for the differences in winter-hardiness of winter forms. Direct study of the inheritance of winter-summer type is difficult as the phenotypes are highly influenced by environment. These types are, however, connected with differences in the shape of the shoot meristems, making it possible to study them at an early stage of development under standardized conditions of cultivation. The inheritance of this meristem characteristic was studied in various barley vars. (*Hordeum distichum* and *H. vulgare*). The parent forms were also subjected to vernalization and photoperiodic treatments to study their physiol. properties. The results show that winter and summer types differ by allelic genes most probably of different intensity in different vars. In addition there are intensifiers for flower retardation interacting with these main alleles. The results of ordinary field expts. on this inheritance are discussed as well as the practical consequences of the work.—G. Östergren.

16313. Kramer, H. H. (Agric. Expt. Sta., St. Paul, Minn.) Morphologic and agronomic variation in *Poa pratensis* L. in relation to chromosome numbers. *Jour. Amer. Soc. Agron.* 39(3): 181-191. 1947.—44 clones of Kentucky bluegrass from a Minnesota collection and 22 clones from 4 introduced strains were compared in small clonally propagated mowing plots and as individual plants in a space-planted nursery from 1940 to 1942. Chromosome numbers in clones from these sources varied from 50 to 68 and 50 to 85, respectively. Significant differences were found in the mowing plots in spreading rate, summer dormancy, yield, and protein percentage. In addition, appreciable variability was shown for 9 characters in the individual plant nursery. 24 of 91 correlation coeffs. between chromosome numbers, characters in the nursery, and characters in the mowing plots were significant but rarely exceeded the value  $r = 0.5$ . Behavior of spaced plants as a criterion of behavior in mowing plots is not very reliable. Chromosome numbers may vary over a considerable range without appreciably affecting morphologic or agronomic behavior.—H. H. Kramer.

16314. MacArthur, John W. (U. Toronto, Canada), and L. P. Chiasson. (St. Francis Xavier U., Antigonish, Nova Scotia.) Cytogenetic notes on tomato species and hybrids. *Genetics* 32(2): 165-177. 2 pl., 4 fig. 1947.—Two wild spp. of tomatoes, *Lycopersicon hirsutum* and *L. glandulosum*, introduced from the high Andes just south of the Equator, bloom freely in short days but set no fruit in southern Ontario. Strains of *L. peruvianum* and its systematic vars. (including var. *humifusum*, or *L. pissisi*) and *L. hirsutum* var. *glabratum* are now fully fertile. Interspecific crosses were attempted in >1600 cross pollinations, and vigorous hybrids differing in fertility have been obtained between spp. in each 2 of the 3 most distinct sections of the genus. These include *peruvianum* ♀ with *glandulosum* ♂, *esculentum* (and *pimpinellifolium*) with *hirsutum*, and *esculen-*

*tum* with *peruvianum* var. *dentatum*. Many crosses for genetic analysis and practical uses introduced recessive marker genes from *esculentum*. These genes are also recessive in the *esculentum-hirsutum* hybrids, and segregate clearly in backcrosses. In species and subgeneric contrasts, dominance tends to be partial or lacking. An unexpected similarity between chromosomes and genomes of the spp. crossed is indicated by regular pairing in  $F_1$  diploids, and by much multivalent association and marked sterility in  $F_1$ 's made tetraploid by colchicine. Evolutionary divergence and establishment of isolating mechanisms have evidently occurred in this group, principally by gene and modifier mutation, and without benefit of ploidy, or major structural rearrangements.—J. W. MacArthur.

16315. Mol, Willem Eduard de. Dreizehn Jahre (1928-1940) Röntgenbestrahlung bei Tulpen und Hyacinthen zur Erzeugung von somatischen Mutationen. *Zeitschr. Pflanzenzücht.* 26(3/4): 353-403. 21 fig. 1944.—By x-ray irradiation of tulips and hyacinths a great number of somatic mutations were produced. These are usually first manifested as sectors and after some yrs. of propagation they may be isolated as new clones. The various mutations are extensively described. Back mutations were observed in some cases. X-rays seem to give the same mutations as arise spontaneously. Radiation can sometimes give modifications of 2 years' duration. It may also activate mosaic virus. Practical advice for such expts. is given.—G. Östergren.

16316. Mostovoj, K. (Res. Inst. Crop Plants, Brno, Czechoslovakia.) Konstitucni sterilita u papriky jednoleté-Capsicum annum. [Constitutional sterility in the annual red pepper.] [In Czech with Ger. summ.] *Sbor. Česke Akad. Zem.* 16: 308-316. 1941.—Constitutional sterility is an inherited character. The different vars. of red pepper have various percentages of plants with deformed flowers.—E. Jermoljev.

16317. Pissarev, V. E., and N. M. Vinogradova. Trigeneric hybrids Elymus × wheat × rye. *Compt. Rend. (Doklady) Acad. Sci. URSS* 49(3): 218-219. 1945.—The authors report successful crosses of rye-wheat amphidiploids with *E. arenarius*.—Courtesy Exp. Sta. Rec.

16318. Sabnis, T. S., and T. R. Mehta. Some observations on the genetics of linseed. *Indian Jour. Agric. Sci.* 15(5): 263-265. 1945.—Crosses made between 2 vars. of flax differing in petal color, white vs. white with violet streaks, indicated differences in 2 genes, which gave a dihybrid segregation into phenotypes in the ratios 9:3:3:1. Inheritance of anther and seed color was monogenic.—C. H. Arndt.

16319. Schröck, Otto. (Kaiser Wilhelm-Inst. Züchtungsforsch., Müncheberg, Mark., Germany.) Untersuchungen an diploiden und tetraploiden Klonen von Luzerne, Gelbklee und Steinklee. *Zeitschr. Pflanzenzücht.* 26(3/4): 214-222. 1944.—Diploid and tetraploid clones of *Medicago media*, *M. lupulina* and *Melilotus albus* were investigated as to winter hardiness and productivity. The tetraploidy had been induced by colchicine. In the 2 spp. of *Medicago* the tetraploids were much more winter-hardy than the diploids; in *Melilotus* the diploids were the hardier. There were clear differences between individual clones. The yield of the tetraploids was somewhat slower than that of the diploids. The development of the tetraploids in *Medicago* was as rapid as that of the diploids. Tetraploid *M. media* was nearly sterile; tetraploid *M. lupulina* was as fertile as the diploid.—G. Östergren.

16320. Smith, Luther. (State Coll. Washington, Pullman.) Possible practical method for producing hybrid seed of self-pollinated crops through the use of male-sterility. *Jour. Amer. Soc. Agron.* 39(3): 260-261. 1947.—It is suggested that environmental conditions could so alter the phenotypic expression of certain genes for male-sterility that in some localities it would be possible to grow self-fertile stocks that were homozygous for the genes for male-sterility. Seeds from these same stocks grown in another locality would produce only male-sterile plants. If these plants were grown in rows adjacent to a pollen-fertile var., the seeds on the male-sterile rows would be hybrid and could be used to produce the commercial crop. The chief doubt as to the feasibility of the method is whether the low frequency of natural crossing and the cost of production would make the hybrid seed too expensive to be profitable in some crops.—Luther Smith.



brown sibs did not show, had larger litters and matured more rapidly than their brown sibs. In comparison with  $C_{87}$  black mice, they, the mutants, were more susceptible to the fibrosarcoma, more active and did not become at all adipose as offspring of  $C_{87}$  black crosses did. The appearance of the 3 mutations in a single litter may be explained either by point mutation or non-disjunction, but it is impossible at present to tell which has occurred, but it may be said that the chromosomes in question were very sensitive to prolonged treatment with methylcholanthrene. So, along with the dominant color change, other evidences of widespread disturbance of the germ plasma were present, increased susceptibility to fibrosarcoma, greater activity and viability.—*M. M. Dickie.*

16340. Wright, Sewall. (*U. Chicago.*) On the genetics of several types of silvering of the guinea pig. *Genetics* 32(2): 115-141. 1947.—In stationary silvering, white or light hairs are mingled with the ground color, especially on the belly, least on head and legs. This depends on a single incompletely recessive autosomal gene *si*. Synthetic silvering of sepias and browns is due to action of well known genes in reducing yellow of the tortoise shell pattern to white. A progressive type of silvering or grizzling appears only after the first pelage especially on the back. It increases greatly thereafter. It depends on an incompletely recessive autosomal gene (*gr*) in conjunction of Lambert. A retrogressive type of silvering or dinginess is manifested only in otherwise intense browns (*bbCP*). In the lowest grades a few hairs on the cheeks and nape are banded subterminally with pale brown. In high grades all hairs are pale brown except at the tip. Dinginess decreases with age, especially in ♀♀. One or more autosomal genes are necessary for any dinginess. In the presence of these, all known series of alleles that affect intensity of brown tend to modify dinginess but in the opposite direction to that expected from their ordinary effects. *CCPPF* is necessary for extreme dinginess. In  $Cc^b$ ,  $Cc^d$ ,  $Cc^e$ , and  $Cc^f$  dinginess is reduced, at least in mature animals. There is no dinginess in genotypes that lack *C* (including  $c^k c^b$  which is nearly as intense as nondingy *C*). *Pp* reduces dinginess greatly and acts cumulatively with  $Cc^k$ , etc., although without apparent effect on nondingy brown. There is no dinginess in pale browns (*pp*). Dinginess is reduced by *ff* which has no apparent effect on nondingy brown with *P* present but eliminates brown in *ffpp*.—*Sewall Wright.*

#### MAN

16341. Bartels, Erik D. Heredity in Graves' disease. 229 pedigrees. 384p. Einar Munksgaard: Copenhagen, 1941.—A study of the role of hereditary factors in the determination of Graves' disease and other thyroid disorders in man. The initial cases for study were found in the hospitals of Copenhagen and its environs. The families of these patients were investigated and compared with a control group. The incidence among the former was found to differ significantly from that of the control group. Regarding the mode of inheritance of Graves' disease, the author writes as follows: "The most reasonable view as to the manner of inheritance is one of monomeric recessivity with sex-limitation to women and a manifestation in them of 70% to 80%." Toxic adenoma in the thyroid, the author concludes, must be regarded as toxicosis in an existing goitre and thus can be hereditary or non-hereditary according to the nature of the goitre. The monograph includes a complete representation of pedigrees and case histories. 248 references are listed.—*H. H. Strandskov.*

16342. Jichlinski, Simon. Les stérilisations et castrations eugéniques, prophylactiques et thérapeutiques. [Eugenic, prophylactic and therapeutic sterilizations.] 96p. Thesis: Univ. Geneva, 1941.

16343. Lindenov, Harold. The etiology of deaf-mutism with special reference to heredity. Einar Munksgaard: Copenhagen, 1945.—An investigation of deaf-mutism and its causes among 32 families on the Danish islands of Seeland, Lolland and Falster. A total of 758 cases were found which in the author's opinion is "very close to the total number on these islands." The author concludes that about 45.5% of all the cases have some hereditary basis. Regarding the mode of inheritance of deaf-mutism, the author writes as follows: "The hereditary transmission of the sporadic deaf-mutism was found to be a monomeric recessive transmission." He also is of the opinion that there may exist a hereditary pre-

disposition for acquired deaf-mutism. No evidence was obtained for a difference in sex incidence. The monograph presents many instructive pedigrees and a complete discussion of case histories. 134 references are listed.—*H. H. Strandskov.*

16344. Ludwig, G., und C. Boost. (*U. Halle a.d.S., Germany.*) Die Abhängigkeit des menschlichen Geschlechtsverhältnisses von Erb- und Umwelteinflüssen, insbesondere vom Krieg. [Dependence of human sex-ratio upon heredity, habitat and war.] *Klin. Wochenschr.* 22: 189-194. 5 fig. 1943.—A good review of influence of war, nutrition, heredity and habitat on the sex-ratio. No relation was found between these phenomena.—*J. Tripod.*

16345. Muller, H. J. (*Indiana U., Bloomington*), C. C. Little (*Roscoe B. Jackson Mem. Lab., Bar Harbor, Me.*), and L. H. Snyder. (*Ohio State U., Columbus.*) Genetics, medicine and man. 158p. Illus. Cornell Univ. Press: Ithaca, New York, 1947. Pr. \$2.25.—A small book based on the Messenger Lectures on the Evolution of Civilization delivered at Cornell Univ. in the fall of 1945. Following a preface by R. A. Emerson the authors discuss: Genetic Fundamentals, Parental Influence, Growth and Individuality, Human Heredity and The Mutant Gene in Man. The book contains a fairly large number of figures, tables, and illustrations.—*H. H. Strandskov.*

16346. Rousseau, Jacques. L'hérédité et l'homme. 250p. Les Editions de L'Arbre: Montreal, 1945.—The author has prepd. a brief résumé of the physical basis and methods of inheritance and catalogued into appropriate divisions many human hereditary characteristics. The genetic bases of most of these traits are discussed only briefly, and some of them are reported to have a simpler type of inheritance than facts justify. The author has a manner of expression which engages the reader's attention. Original sources of data are not usually given. Except for an occasional gem of humor, nothing unusual is found in the chapters dealing with the elements of heredity. Diagrammatic figures used to explain genetic crosses are well done and helpful to a reader. A chapter on sex determination includes folk tales about sex control. It is unfortunate, however, that with his references to the use of a douche by Unterberger, by investigators using exptl. animals to get a preponderance of one sex, and in the ultimate production by that means of a ♂ heir to Hirohito, the author did not refer to the less favorable results obtained by other workers. In several chapters, the author names and briefly discusses many human hereditary anomalies and nonabnormal traits. These include body-build and anatomical characteristics and defects, blood diseases, metabolic defects, nervous and mental disorders, diatheses, and talent and character. Baldness is explained as a sex-influenced trait due to a one-gene difference, but the author's use of different symbols for ♂♂ and ♀♀ may be disturbing to the general reader. The inheritance of the blood groups and types and their use in determining parentage are explained rather completely. The author refers to and explains the 3 theories of inheritance of the AB groups—that is, as multiple alleles, 2 pairs of genes with independent assortment, and two pairs of linked genes. In a concluding chapter on eugenics the author discusses the erroneous belief that eugenics and sterilization are synonymous, the blame being placed upon the mock modesty of the Anglo-Saxons. He cites the many methods which have been followed or suggested in the practice of negative and positive eugenics. The author specifies those methods which some persons cannot accept because of religious or other beliefs and mentions others, such as premarital examinations and studies of family histories with suggested celibacy or continence, which might be followed. The use of genetic analysis to help guide a person into proper marriage is a method of eugenics which should be emphasized more.—*C. P. Oliver (courtesy Science).*

16347. Schiele, B. C. Huntington's chorea in relation to the heredity of personality disorders. *Jour.-Lancet* 66: 393-396. 1946.—Huntington's chorea may be transmitted to a child by either parent, but the hereditary factor is not the only determinant of behavior, since environmental factors may influence many of the behavioristic aberrations. Many members of the afflicted family may be unaffected and attain eminent positions. Recovery from this condition is unknown. After age 55 a member of such a family runs no risk of de-

veloping the disease. It is suggested that a study of siblings in an affected family be made in order to discover the criteria of those who will develop chorea, using the Minnesota Personality Inventory, the Rorschach test, the psychometric measurements of motor control, coordination, and steadiness, and, by intelligence tests, to determine changes produced by involvement of brain cells. Eugenic control is also recommended.—F. A. Cooksley (*courtesy Psychol. Absts.*).

16348. Strandkov, Herluf H., and Doris Ondina. (U. Chicago.) A comparison of the percentages of stillbirths among single and plural births in the total, the "white" and the "colored" U. S. populations. *Amer. Jour. Phys. Anthropol.* 5(1): 41-54. 1947.—The stillbirth percentages among single, twin, triplet and quadruplet births in the total, the "white" and the "colored" U. S. populations from 1922 to 1936 are presented and compared. In each of the 3 populations, the stillbirth percentage increases significantly with each increase in number of embryos per pregnancy or, as the mammalogist would say, with each increase in size of litter. The probable causes are briefly discussed. A comparison is made with stillbirth percentages among normally multiparous species. The % of stillbirths is shown to be signifi-

cantly higher among ♂♂ than among ♀♀ in the different types of births, i.e., in the single, twin and triplet births. It is concluded that the sex differences in stillbirth percentages are due primarily to genetic factors. Racial difference are found. The percentage of stillbirths is shown to be significantly higher among both the single and the plural births of the "colored" population than among the corresponding births of the "white." The responsible factors are concluded to be primarily environmental. Evidence, however, is presented which indicates that genetic factors could be partly responsible.—*Auth. (courtesy Wistar Bibl. Serv.)*.

16349. Walker, Leonard. (U. California, Berkeley.) Mechanism of sex determination. *Science* 105(2723): 262-263. 1947.—The ratio of ♂♂ to ♀♀ in man is 106:100 which deviates from the 1:1 ratio predicted by the chromosomal theory. It has been stated that the difference in mass between the ♂- and ♀-producing sperm (androsperms and gynosperms) produce different velocities and this is the decisive factor. It is shown, by quantitative evidence, that to produce an appreciable difference between the velocities of the 2 types of cells, the differences in mass would have to be larger than could reasonably be expected.—H. M. Kaplan.

## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 16377, 16443, 16555, 16590, 16644, 16658, 16662, 16679, 16689, 16698, 16709, 16741, 16743, 16767, 16825, 16839, 16864, 16948, 16950, 16954, 17043, 17046, 17102, 17155, 17273)

16350. Habs, H. (*Med. U. Poliklin. Marburg, Germany.*) Herstellung geometrischer Reihen. [Setting of geometrical series.] *Klin. Wochenschr.* 21: 348. 1 fig. 1942.—According to Augsberger (*Klin. Wochenschr.* 20: 887, 1941) a geometric progression is best for biologic dilutions. The author employs a nomogram (logarithmic-arithmetic) for such dilutions.—J. Tripod.

16351. Pinto, B. F. de Arruda. Breves considerações sobre os erros em agrimensura—Erro de fechamento. *Rev. Agric. [Piracicaba]* 21(9/10): 361-378. 1946.—The error of closure was calculated in a way that is not the most common. The text contains actual problems which are worked out and the development of formulae is explained.—F. P. Jeffrey.

16352. Schelling, H. v. Fehlerrechnung bei biologischen Messungen. [The error treatment in biological values.] *Klin. Wochenschr.* 20: 741-743. 1941.—In chemotherapeutic expts. on animals (cf. Prigge, *Klin. Wochenschr.* 20: 633-657. 1941), the mortality rate was found to give the soundest results statistically. In preference to various functions of the survival time, and probits (cf. Bliss, *Ann. Appl. Biol.* 24: 815. 1937), the author uses the "central value" (arithmetical or harmonical mean) of the death's days with its probability for 25, 50 and 75% total deaths.—J. Tripod.

16353. Sols, A. (*Fac. Medicina, Barcelona.*) Fórmulas y tablas colorimétricas para corregir las aparentes desviaciones a la ley de Beer. [Colorimetric formulas and tables to correct the apparent deviations of Beer's law.] *Rev. Española Fisiol.* 1(4): 355-414. 1945.—Stating that the foundation of colorimetric analysis based upon Beer's law is indirect in its application in the majority of cases, Sols points out that certain apparent deviations appear to be subject to correction by the use of an equation as follows:

$$(C + I)E = (C' + I)E'$$

when  $C$  and  $C'$  = concns.,  $E$  and  $E'$  = thickness of the layer and  $I$  = the algebraic sum of the impurities and constant losses that should be added to or subtracted from the intensity of the color of the reaction. By means of this formula Sols states it is possible to obtain a proportionality in many cases that would otherwise show a deviation with the older equation,  $CE = C'E'$ . He presents a simple procedure for calculating  $I$  for the purpose of comparing the 2 standards. In detn. of P, uric acid and creatinin under unfavorable conditions and with wide difference in concns., he has found that these formulas prove to be of real value. 37 pages of special tables are presented for the purpose of obtaining concn. values

directly when  $I$  is not equal to zero.—M. L. Montgomery.

16354. Terrill, H. M., and Lucile Sweeny. An extension of Dawson's table of the integral of  $e^{x^2}$ . *Jour. Franklin Inst.* 237(6): 495-497. 1944.—The function  $e^{x^2}$  is useful in evaluating certain integrals which may arise in mathematical physics. Thus it has been employed in connection with short-wave oscillations and in the theory of heat conduction. H. G. Dawson has tabulated the value of the integral over limited range. The present table extends the series for values from  $x = 2.00$  to  $x = 4.00$ . A correction for the value given by Dawson for  $x = 1.92$  is noted.—R. K. Jennings.

16355. Terrill, H. M., and Lucile Sweeny. Table of the integral of  $e^{x^2}$ . *Jour. Franklin Inst.* 238(3): 220-222. 1944.—Dawson's table for values of the integral of  $e^{x^2}$  from  $x = 0$  to 2.00 was recomputed. Values of the integral for a series of key arguments differing by 0.1 were computed directly by series, making use of the tables of probability functions prepared by the WPA. Intermediate values were filled in by Gregory formula, using values of the integrand obtained from the WPA "Table of the Exponential Function."—R. K. Jennings.

16356. Terrill, H. M., and Lucile Sweeny. Two constants connected with the theory of prime numbers. *Jour. Franklin Inst.* 239(3): 242-243. 1945.— $B$  is a constant in the expression for the sum of the reciprocals of prime numbers  $\frac{1}{2} + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \frac{1}{11} \dots \frac{1}{p} \rightarrow \log \log p + B$  and  $D$  is a constant used in determining the value of  $B$ . By methods described, the value of  $D$  to 23 decimal places was set at  $D = -0.31571845205389007685108$ . This value disagrees with that stated by a previous author, in the 11th digit. Recalculation by the method of that author was undertaken and the present value affirmed.

$B = 0.26149721284764278375543$ .—R. K. Jennings.

16357. Yates, F. (*Rothamsted Exptl. Sta., Eng.*) The place of statistics in agricultural research. *Agric. Progr. [London]* 21(1): 40-50. 1946.—The ways in which statistics have been found to be of assistance in agric. research are described. The statistician can help in estimating the number of estimations to be made in any expt., in assessing the degree of variability and by suggesting the number and kind of samples to be taken. The theory of estimation, tests of significance and probits are described. Questions of expt. design are considered and the advantages and disadvantages of the method of factorial design are pointed out. The statistician can also play an important part in the analysis of accumulated masses of exptl. data and in the analysis of survey data. Statistical advice should be consulted at the planning stage in any expt.—D. Snow.

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 16286, 16604, 17835, 17954, 18557, 18558, 18602)

## MICROSCOPY AND TECHNIQUE

16358. Franklin, G. L. (*Forest Prod. Res. Lab., Princes Risborough, Eng.*) A rapid method of softening wood for microtome sectioning. *Tropical Woods* 88: 35-36. 1946.—Small, appropriately cut cubes of wood,  $\frac{1}{2}$  inch on a side, are placed in a mixture of 1 part by volume of glacial acetic acid and 2 parts by volume of  $H_2O_2$  and heated for 1-3 hrs. in a reflux condenser. The blocks are then washed in running water or a few minutes, and then may be sectioned. Woods such as persimmon, black locust, or rock elm may be softened in an hour; lignum vitae, ebony, and woods of similar density are softened in about 3 hrs. The effect of the treatment is to partially delignify the wood, and is not recommended for work involving microchemical investigations.—E. S. Harrar.

16359. Loos, W. (*Mikro-Lab. d. Opt. Werke Carl Zeiss, Jena, Germany.*) Das Phasenkontrastverfahren nach Zernike als biologisches Forschungsmittel. [Biological investigations by the use of contrast phases according to Zernike.] *Klin. Wochenschr.* 20: 848-853. 13 fig. 1941.—The new use of contrast phases in microscopy shows some improvements over the old dark and light fields. This effect is due to artificial changes of the light phase at the objective exit. Very good comparative histological and bacteriological pictures show a real improvement.—J. Tripod.

16360. Wichterman, Ralph. (*Temple U., Phila.*) A new glass device for staining cover-glass preparations. *Science* 103(2662): 23-24. 1 fig. 1946.—The device consists of a small glass rack designed to hold cover slips similar in type to those customarily used for slides.

16361. Anonymous. Trichrome stain for formalin fixed tissue (Milligan). *Lab. Digest* 10(9): 1. 1947.—A staining method which gives sharp differentiation of muscle and connective tissue but weak results in the nuclear stain is described. It is chiefly a discussion of M. Milligan's technique employing acid fuchsin; orange G; and fast green or niline blue with a mordant (*Amer. Jour. Clin. Path.* 16: 1, 184-185. 1946). Good Kodachrome photomicrographs have been made with the addition of the fast green.—Robert Rosenbaum.

## LABORATORY APPARATUS AND TECHNIQUE

16362. Bezman, I. I., and E. P. Barrett. (*Mellon Inst. Indust. Res., Pittsburgh.*) Water-level regulator for a series of high temperature water baths. *Science* 103(2674): 401. 1 fig. 1946.—The device consists of a large-stoppered bottle placed over the bath, the height of which is regulated. Two tubes lead from this reservoir, one going below the surface of the bath to feed water, the other adjusted to the level, at which it is desired to maintain the bath. When this 2d tube is closed by the rising water, the air inlet to the reservoir is cut off so that no further water can siphon from it.—Peter Gray.

16363. Hiestand, W. A. (*Purdue U., Lafayette, Ind.*) The electric hair drier, a useful laboratory tool. *Turtax News* 25(4): 78. 1947.—Used to evaporate liquids; to dry negatives, lantern slides, prints; to change temp. of liquids and lab. animals.—R. W. Dexter.

16364. Terrill, H. M. Counterbalanced plugs for the high speed angle centrifuge. *Jour. Franklin Inst.* 237(1): 73-75. 1 fig. 1944.—The walls of celluloid sample tubes are subject to collapse and even breakage at speeds in the range of 40,000 RPM. An aluminum alloy plug has been designed which reinforces the wall by means of a sleeve extending into the sample tube and counterbalanced by an external sleeve which reduces the tendency of the internal portion to cut into the celluloid and to cause undue stresses within the rotor. The 2 portions are separated by a thin membrane of aluminum, and the plug rests on a collar which prevents the centrifugal force from driving the plug into the tube. The apparatus is only suitable for use with the angle head.—R. K. Jennings.

16365. Wagner, R. (*Physiol. Inst., Innsbruck, Austria.*) Über die Wahrnehmung schattenloser Objecte. *Zeitschr. Biol.* 100(5): 421-429. 1941.—The author describes the use of a hollow sphere fitted with a detachable lid and peephole and painted inside with luminous paint, to illuminate bodies equally on all sides. Tests with small prisms, rods, etc., show that the stereoscopic observation of such objects is due to their one-sided illumination. The implications of the work for problems of spatial vision and distance estimation are discussed.—D. M. Ross.



## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Famine effects on Greek children, 16388; Rachitic changes in mandibular condyle, rat, 16843; Corpse in the peat bog, 18644)

16366. Balogh, B. Egyetemi hallgatók alkattipusainak megoszlása. [Distribution of types of constitution in students in Hungary.] *Suppl. Természettudományi Közlöny* 76(3): 169-171. 1944.—In connection with medical and anthropological examinations, the students of the Univ. of Debrecen (Hungary) were investigated as to const. type (748 ♂♂, 126 ♀♀). The somatic types in %, for ♂♂ and ♀♀ respectively, were: leptosome—34.1, 39.7; obviously pathologically asthenic—3.5, 1.6; athletic—21.8, 14.3; pyknic—15.8, 11.1. Mixed types: lept.-athl.—11.2, 19.8; lept.-pyk.—6.7, 7.9; pyk.-athl. 6.7, 5.5. Dysplastic 0.2, 0. The lept.-athl. mixed type is often very advantageous (vitality, inclination for sport). The const. type showed no special characteristics for students in the various departments, but probably some types are advantageous in certain professions. Considering only ♂♂, the leptosome type is most freq. among the medical students (43.6), rarest among the students of philosophy (28.9). Theological students showed few of the athletic type (16.9), but the largest % of pyknic type (25.4). Of the mixed types, the lept.-athletic was most numerous among law students (14.2), the lept.-pyknic type (containing the most disharmonic elements) the most frequent among students of philosophy (13.2).—*B. Balogh.*

16367. Braun, Hugo, und Ziya Oktem. Über die Blutgruppenverteilung bei Türken. [Blood group distribution in Turks.] *Istanbul Seririyati* 1938 (2): 1-4. 1938.—Data on 9226 men and women of Turkey show group A—45.8%, group B—15.3%, group AB—7.0%, group O—31.9%. The higher proportion of A in the population compared with that found in western European nations is further evidence that the A-gene arose by a mutation which occurred in central Asia. From the blood group distribution of nomads it appears that these tribes are descendants rather than forbears of the Turk.—*Orville Wyss.*

16368. Brew, J. O. Archaeology of Alkali Ridge, southeastern Utah, with a review of the prehistory of the Mesa Verde division of the San Juan and some observations on archaeological systematics. [With Appendices by Alice Brues and Volney Jones.] *Papers Peabody Mus. Amer. Arch. and Ethnol., Harvard Univ.* 21: i-xv. 1-345. 192 fig. 1946. Pr. \$7.50.—To clarify the status of the Pueblo II culture, 13 sites were excavated on Alkali Ridge. The structures and artifacts discovered are ascribable to cultures ranging from Basket-Maker III to Pueblo III, inclusive (Pecos classification). Tree ring dates available from 3 B-M III pit-houses give date of 770 A. D. Burials were found in the following: Pueblo I, 1 ad. ♂; Pueblo II, 4 infants, 3 ad. ♂♂, 2 ad. ♀♀; Pueblo III, 4 infants, 5 children, 3 adolescents, 6 ad. ♂♂, 6 ad. ♀♀, 1 indet. Measurements, indices, and observations for 16 skeletons are presented by Alice Brues in Appendices A and B. All crania, except one ♀, show lambda-occipital deformation. Uncorrected gl-op cranial L for 7 ♂♂ ranges 158-173 mm.; max. B 142-157; ba-br H 133-145; total FI (5), 82-(104). Uncorrected gl-op cranial L for 4 ♀♀ ranges 158-163 mm.; max. B (5), 137-149; ba-br H (4), 136-142; total FI ranges (3), 84-(92). Pathological manifestations include arthritis, periostitis, osteoporosis, rickets (?), and non-tubercular vertebral kyphosis. Brew reviews the question of the hitherto postulated swamping of the dolichocephalic B-M III pop, ca. 700 A. D., by an invading brachycephalic P. I pop. and the assumed subsequent change from B-M to Pueblo culture. He cites Seltzer's and Woodbury's inferences that, except for the P. IV Rio Grande pop. and for the introd. of lambda-occipital deformation in P. I, the B-M and P. pops. are essentially similar and prevalently mesocephalic. The author considers the archaeological evidence and infers that it [chiefly the data had from architecture and ceramics] leads to a similar conclusion concerning B-M—Pueblo cultural continuity. Proceeding with his review of Mesa Verde archaeology and its relationships to SW archaeology generally, he considers that the hypothesis of the Mogollon as an antecedent "basic culture" which had considerable influence on the B-M—Pueblo and Hohokam cultures is based on insufficient

evidence. The Hohokam he accepts as a culture with many traits which distinguish it from Pueblo; however, he holds that evaluation of the Pueblo-Hohokam resemblances is restricted by the lack of reliable dates for the Hohokam. Discussing the use and abuse of taxonomy in archaeology, he pleads for a more adequate definition of the concept, "a basic culture", and the requisite criteria. Urging less rigid adherence to any one classification, he manifests this eclecticism by categorizing his materials from Alkali Ridge according to both the original and Robert's revision of the Pecos classification, as well as according to the Gila Pueblo and the Museum of Northern Arizona's taxonomies. In Appendix C, Volney Jones identifies the plant remains, chiefly corn and beans, with pinyon nuts as the only uncultivated plant food. Apparently already in Pueblo I there were 3 spp. of cultivated beans.—*R. M. Snodgrass.*

16369. Heyns, O. S., and J. E. Kerrich. (*U. Witwatersrand, S. Africa.*) The number of vertebrae in the fetal Bantu sacrum. *Amer. Jour. Phys. Anthropol.* 5(1): 67-78. 1947.—The number of vertebrae constituting the fetal sacrum has been studied in 20 Bantu fetuses. In 19 fetuses the sacra contained 6 vertebrae each, and in 1 the sacrum was probably 6-piece. Histological confirmation of the cartilaginous nature of the lateral wall of the 5th sacral foramina was obtained. The fate of the cartilaginous lateral mass of the sacrum is discussed, and the conclusion arrived at that in about 80% of individuals the cartilage of the 5th sacral foramen becomes the lateral sacro-coccygeal ligament, but that in the remainder the cartilage ossifies producing, as a result, the 6-piece sacrum. Consideration is given to the role of this mechanism, known to occur only in the Bantu but probably present in other races, in the production of the variable incidence of the 6-piece sacrum in series reported from different regions. The statistical problem presented by observations on a small series of 20 was sufficiently significant to justify the introduction of a note by a mathematician who has discussed the statistical aspect of the investigation, and agrees with the conclusion that the fetal sacrum in the Bantu contains 6 vertebrae.—*Auth. (courtesy Wistar Bibl. Serv.).*

16370. Jones, Harold E. (*U. California, Berkeley.*) The relationship of strength to physique. *Amer. Jour. Phys. Anthropol.* 5(1): 29-40. 2 fig. 1947.—In a group of 80 public school boys, approx. 17.5 yrs. of age, the relationship was studied between static dynamometric strength, height, weight, and assessments of somatotype. Strength was found to be positively related both to body size (especially wt.) and to the mesomorphic compound of body build. Mesomorphy, however, had little or no relation to wt. and was negatively correlated with height. Striking exceptions occurred to the relationship between strength and size, as illustrated by boys who were large but weak, or small but mesomorphic and strong. Taken alone, weight accounted for only 25% of the variance in strength, but 75% of the variance was controlled when the components of body build were included with wt. and height, in proportions based on a multiple regression equation.—*Auth. (courtesy Wistar Bibl. Serv.).*

16371. Martin, Paul S., George I. Quimby, and Donald Collier. (*Chicago Nat. Hist. Mus.*) Indians before Columbus. 582p. Frontispiece. 122 fig. Chicago U. Press Chicago, Ill., 1947. Pr. \$6.—This is the story of 20,000 yrs of N. American prehistory. In Part I the authors discuss archaeological methods and the early theories of human migration into the Western Hemisphere. In Part II there is detailed analysis of arts and industries: stone, copper, bone and shell, pottery, textile arts, basketry and cloth, and trade and commerce. In Part III the geologico-archaeological evidence for early human culture is discussed, with special reference to the Folsom and Cochise cultures. The volume then presents a very useful regional analysis of N. American archaeology: Southwest, Eastern N. American, the Pacific Slope, and the Far North. The Southwest shows by far the best synthesis. The Anasazi, Hohokam, and Mogollon-Mimbres cultures are discussed in detail with particular refer-

ence to their inter-relationships. When the authors consider the other areas they depend almost solely upon a state-by-state form of organization, disregarding, in effect, the more generally accepted culture-area concept. Within each region and/or state the several cultural subdivisions are succinctly summarized by a short analytic trait-outline. At the end of each of these summaries the principal references are listed. There is in addition, for each region, a short chronological tabular summary. In Fig. 122 (pp. 514-17) there is a final over-all chronological summary. The volume is a useful survey for college courses in anthropology and the social sciences generally.—*W. M. Krogman.*

16372. Molnár, Vilmos. Egyetemi hallgatók vércsoportvizsgálata a budapesti tudományegyetemen. [Blood grouping tests of the University students of Budapest.] *Hungarian Med. Arch.* 42(3): 273-284. 1941.—In a series of 5000 students, Group O comprised 32.7%, A 42.9%, B 6.6%, and AB 7.8%. Percentages of blood-group factors according to Bernstein were  $r = 57.2$ ,  $p = 29.8$ ,  $q = 13$ . The Hirschfeld index was 2.07. Less B properties were found among the students than in the gen. pop. The blood group division of the East European type is nearest the general iv. There is no relationship between race and blood groups. The students of German names show less B than the Magyar iv. Those having Slav names show more B. The distribution of blood groups in connection with the defects characteristic of civilization (tuberculosis, dental caries, defects of vision) showed nothing characteristic. The factors M and N of 2500 students were also detd.: M, 29.4%; MN, 52.6%; N, 18%.—*B. Balogh.*

16373. Schultz, Adolph H. (*Johns Hopkins U., Baltimore, Md.*) Variability in man and other primates. *Amer. Jour. Phys. Anthropol.* 5(1): 1-14. 1 fig. 1947.—Some of the available information on the variability of mammals in general and of primates in particular is briefly reviewed and the intraspecific variability of man is compared with that in some monkeys and apes. Special attention is given to some metric characters of the outer body and of the skeleton and of skin- and hair-color. The facts presented here contradict the recent claims of Montagu that primates are more variable than other mammals and that man is the most variable of all animals. The degrees of intraspecific variability differ widely among primates and frequently are not in the least unusual. It is demonstrated also that, regarding variability, the great apes generally equal, and in some respects surpass man, and that in certain features man is more stable than many other primates.—*Auth. (courtesy Wistar Bibl. Serv.).*

16374. Senyürek, Muzaffer Süleyman. (*U. Ankara.*) A note on the duration of life of the ancient inhabitants of Anatolia. *Amer. Jour. Phys. Anthropol.* 5(1): 55-66. 1947.—This paper is based on the study of a total of 122 specimens of ancient Anatolians ranging in time from the Chalcolithic period to Roman-Byzantine times. It appears that, though they had the potential of longevity, most of the ancient Anatolians died at a relatively early period of life and that their average longevity was relatively shorter than that of modern civilized man. It also appears that in ancient Anatolia, mortality among the ♀♀ in the earlier periods of life was relatively higher than that among the ♂♂. Though the slower rate of sutural union in the ♀♀ may also be to some extent involved, this observed percentage difference in mortality between the sexes in the earlier periods of life, corresponding in general with the childbearing period, must be largely attributed to the hazards of childbearing.—*Auth. (courtesy Wistar Bibl. Serv.).*

16375. Sera, G. L. (*U. Naples, Italy.*) La genesi del piede e l'acquisto dell'attitudine eretta nell'uomo. [The genesis of the foot and the acquisition of the erect attitude in man.] *Arch. Ital. Anat. e Embriol.* 46(3): 205-287. 18 g. 1941.—After a discussion of the theories on the subject, the foot of a life-sized model of a Bushman is descr. and compared with the skeleton of the foot of a Bushman studied by Pritsch. Also the bones of the feet of 11 Bushmen are descr. It is found that the arch of the foot is a very good one, and is assured by a peculiar formation of the articulation between the navicular and the medial cuneiform. The articular line between the tarsus and the metatarsus shows a strong obliquity backwards, beginning from the inside to the outside; this means that the 4th and 5th rays are displaced

towards the heel. This must have been due to a subvertical position and must have caused, through the cuboid, the horiz. rotation of the calcaneum to the position characteristic of man. The part taken in this process by the various muscles is discussed. It is supposed that in man the suberect posture was reached directly, and that at the same time the pelvis became inclined forward, the av. flexion angle of the trunk with the thigh being small. The tendency to fall forward must have been avoided by a large backwards flexion of the lumbar region. The Bushmen show a strongly inclined pelvis and a saddle-shaped lumbar region, both of which could be the remainder of this evolution, furnish proof of this hypothesis. Only when a more stable equilibrium of the trunk on the femur was reached, the heel was lowered to the ground and a true erect position was reached. Other changes follow, as a diminution of the total height of the longitudinal arch and the disappearing of the post. position of the 4th and 5th metatarsuses. By this hypothesis it is excluded that men have derived from monkeys and it is claimed that only in forms directly preceding some Lemurs (subf. Indrisinae and Lemurinae) the necessary antecedents may be found.—*M. A. Barbasetti.*

16376. Snow, Charles E. The skeletal remains from the Riley site, Be 15" and the skeletal remains from the Landing site. In: The Riley mound, site Be 15 and the Landing mound, site Be 17, Boone Co., Ky., with additional notes on the Mt. Horeb site, Fa 1, and sites Fa 14 and Fa 15, Fayette Co., Ky., by W. S. Webb. *Univ. Kentucky Publ. Anthropol. Archaeol.* 5(7): 586-697. 1943.—Pr. 50¢.—8 skeletons, 7 representing burials in the flesh and 1 a cremation, were discovered at the Riley site. Some measurements were possible on the 3 adult ♂♂, but none could be taken on the cremated ♀ nor on the 4 skeletons of which the sex was undetermined. The 1 measurable ♂ cranium, in the few measurements possible, approximates most closely the means obtained for Adena ♂♂. Typologically, this skull conforms to the Centralid type of American Indian. Skeletons of 5 ♂♂, 3 ♂♂?, 1 ♀, 2 ♀♀?, and 4 indeterminate individuals, ranging in age from 4-5 yrs. to a ♂ of 30-35 yrs., were found at the Landing site. Metric data are presented for 2 deformed, 2 slightly deformed, and 1 undeformed ♂ crania as well as for 1 deformed ♀ cranium. The undeformed adult ♂, the only practically complete Adena Skeleton found in Ky., conforms to Neumann's Sylvid type while the other crania represent N.'s Centralid type (Hrdlička's Gulf type). Glabella-occipital length of the undeformed adult ♂ is 168 mm.; max. breadth, 129 mm.; basion-bregma height, 138 mm.; cranial index, 76.8; nasion-prosthion height, (67) mm.; bizygomatic breadth (125) mm.; upper facial index, (53.6). This cranium and the 2 slightly deformed ♂ crania average (174.0) mm. in glabella-occipital length; (139.7) mm. in max. breadth; cranial index averages (80.2); nasion-prosthion height, (69.0) mm.; bizygomatic breadth, (134.7) mm.; upper facial index, (51.5). Mean glabella-occipital length of the 2 markedly deformed adult ♂♂ is 153.0 mm.; max. breadth, 149.0 mm.; basion-bregma height, 146.0 mm.; cranial index, 94.3; nasion-prosthion height, (73.5) mm.; bizygomatic breadth, (140.0) mm.; upper facial index, (52.5). Mensurational and observational data were obtained on the infra (post)-cranial skeletal parts. Estimated stature for the adult ♂♂ from the Riley and Landing sites is ca. 5' 5" and for the adult ♀ from the Landing site, 4' 11.5". Pathological lesions were common and comprise: arthritis, osteoporosis symmetrica, syphilis (?), and abscessed and carious teeth. Inferentially, these individuals rested in a squatting position.—*R. M. Snodgrass.*

16377. Thurstone, L. L. (*U. Chicago.*) Factorial analysis of body measurements. *Amer. Jour. Phys. Anthropol.* 5(1): 15-28. 1947.—There has been a recurring interest in the problems of body types in which attempts have been made to relate these types to the incidence of physical and mental disease, and to temperament. It is a question of fact whether the various body measurements that have been proposed actually constitute a system that can be described in terms of a small number of parameters, factors, or types, whatever the extremes may be called. This is exactly the kind of problem for which multiple factor analysis was designed. The present paper is a re-analysis of a set of 18 body measurements that were made by W. Linford Rees and H. J. Eysenck of London. It is here shown that the 18

measurements can be described as linear combinations of 7 underlying factors which can be given tentative interpretation. The interpretation of these factors should be checked

with factorial results for larger sets of body measurements by which the nature of each factor should be clarified.—*Aulh. (courtesy Wistar Bibl. Serv.)*.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; Geriatrics; and: Sex ratio, 16344; Essential fatty acids in nutrition, 16759; Wartime malnutrition in children, France, 16770; Essential amino acids in nutrition, 16786; Blood vit. A and C levels in students, 16816; Rachitic changes in mandibular condyle, rat, 16843; Theories of nutrition, 16863; Human starvation and its consequences, 16865; Nutritional improvement of life, 16873; Evaluation of nutrition in childhood, 16878; Incidence of diabetes, 16948; Problems of the aging population, 16952, 17258, 17259, 17260; Periodicities in reproduction, 17035; Anesthesia as technique of psychoanalysis, 17105; Fatigue, stimulation and drugs, 17252; Relation of good housing to health, 17763; Medicine in the changing order (book), 17765)

### POPULATION, FERTILITY, VITAL STATISTICS

16378. Blacker, C. P. Positive eugenics: A proposal. *Eugenics Rev.* 38(1): 25-26. 1946.—Financial help should be given parents of 3 recognizably superior children to aid in rearing a 4th. This should apply to public school children and not to those in expensive private schools. Plan should be administered by local associations very tactfully and with advice of educators and medical health officers.—A. R. Middleton.

16379. Casis, Ana, and Kingsley Davis. (Princeton U., N. J.) Urbanization in Latin America. II. Traits of the urban and rural populations. *Milbank Memorial Fund Quart.* 24(3): 292-314. 3 fig. 1946.—Rural-urban differences in fertility, mortality, age distribution, marital status, legitimacy, literacy and language as shown by the rather scanty statistics available in Latin America show a general tendency for the urban populations to conform to those characteristics associated with modern Western industrial civilization although these countries are still in the industrial revolution stage. There is evidence that differences between country and city are decreasing.—E. K. Kline.

16380. Davis, Kingsley. (Princeton U., N. J.) Future migration into Latin America. *Milbank Memorial Fund Quart.* 25(1): 44-62. 1947.—Since Latin America embraces 16% of the world's inhabitable land and has only 6% of the world's people, it is commonly believed to offer opportunities for mass migration. However, the kinds of immigrants that Latin American countries want, agricultural laborers of Latin culture, are not attracted and restrictions on admission and discrimination against other types prevent migrations, which in any case are not needed since the fundamental problems of these countries is not lack of people but lack of skills and capital.—E. K. Kline.

16381. Gumbel, E. J. Probability of death and expectation of life. *Human Biol.* 18(4): 238-240. 1946.—For an exponential life table which holds for radioactive substances, a multiplication of the probabilities of disintegrating (dying) within a constant short interval by a constant factor leads to the division of the expectation of life by the same factor. This relation cannot hold for human life tables since the probabilities of dying within a constant interval depend, in this case, upon the age.—E. J. Gumbel.

16382. Keller, J. D. Growth curves of nations. *Human Biol.* 18(4): 204-220. 1946.—A smoothed curve drawn through the stepped graph of territorial growth of the Roman Empire conforms quite well to a combination of 2 sigmoid growth curves of simple logistic form; the 1st, dominant during the period of growth, being of the usual form, while the 2d, corresponding to the period of decline, has a negative coeff., a time lag referred to the first curve, and an almost doubled growth (decay) rate. The irregularity of the stepped curve, however, would have made it impossible to predict either the inflection point or the peak of growth a century in advance. When the stepped graph of territorial growth of the U. S. is corrected from nominal to actually controlled territory, a smoothed curve drawn through it corresponds to the early part of a sigmoid growth curve, in which the inflection point has not yet been reached. The present stage of growth of the U. S. is found to correspond to that of Rome at about 150 B.C. The growth rate, based on % increase per yr., has been almost exactly the same for the U. S. as for Ancient Rome. Assuming the similarity of the curves to continue into the future, the American empire would be

expected to reach its zenith about A.D. 2200, with a magnitude 6-7 times that of the present U. S.; but no prediction can be risked until numerous other national or imperial growth curves have been studied and compared. In any case, national expansion differs from other forms of growth in being largely subject to conscious control.—J. D. Keller.

16383. Moore, Wilbert E. (Princeton U., N. J.) The migration of native laborers in South Africa. *Milbank Memorial Fund Quart.* 24(4): 401-419. 6 fig. 1946.—Mining and to a slightly lesser extent manufacturing in S. Africa is dependent on migrant native labor recruited from tribes living in other areas than the locations of the industries. This labor is generally transient in character and there is a steady flow of migration to and from industrial areas. The article assembles fragmentary evidence as to the extent of this movement and discusses the social implications.—E. K. Kline.

16384. Slater, Eliot. An investigation into assortative mating. *Eugenics Rev.* 38(1): 27-28. 1946.—Husbands and wives resemble each other in intelligence as do brothers and sisters. If extended over a wide range of hereditary biological qualities this would amount to intensive inbreeding. Among 50 neurotic soldier patients and their wives and 50 soldiers from general wards of the same hospital and their wives, the incidence of neurosis among the wives of neurotics was twice as high as among the wives of non-neurotic soldiers.—A. R. Middleton.

16385. Taeuber, Conrad. Wartime population changes in the United States. *Milbank Memorial Fund Quart.* 24(3): 235-250. 1946.—The total population of the U. S., including the Armed Forces at home and abroad, increased at an average rate of nearly 1.2% per annum from 1940 to 1946, reaching more than 140 million. Declining civilian mortality, as evidence by low death rates and low maternal and infant mortality, and a small net immigration contributed to population increases, but the fundamental factor was increasing fertility. Approx. 1/5 of the population moved their place of residence during the war resulting in population concs. in the West and in metropolitan areas but the general pattern of migration probably represented an acceleration of forces operating during recent history. For this reason it is doubtful if large numbers of migrants will return to previous places of residency. The effect of these population changes on fertility rates of the future is difficult to assess.—E. K. Kline.

16386. Taeuber, Irene B. (Princeton U., N. J.) Migration and the population potential of Monsoon Asia. *Milbank Memorial Fund Quart.* 25(1): 21-43. 4 fig. 1947.—The 1.2 billion and potential 4 to 8 billion people of non-Soviet Asia live under the constant threat that population increases will be greater than the ability of the land to offer possibility of subsistence. The demography of rice culture and the impact of the west have tended to increase this danger. If future changes follow the pattern of those in Japan, industrialization and urbanization will eventually result in declines in fertility which will tend to lessen population pressures, but it is doubtful if this will take place rapidly enough to permit an orderly transition.—E. K. Kline.

16387. Thomson, Godfrey. The trend of national intelligence. *Eugenics Rev.* 38(1): 9-18. 1946.—Competent investigators show from -0.19 to -0.224 correlation between intelligence and size of family. There is a decline of at least 2 points Binet I. Q. per generation. Thomson found the estimated I. Q. of parents of 1,084 tested children 101.04,



that of all their 4,387 children 98.98. Investigations show decline of intelligence from slightly  $<2$  points to  $>3$  points per generation. One point of this average 2 points is due to heredity and selection. The need is for actual measurement of 2 successive generations. Large numbers of correlations between different mental activities (factors) are positive. This possibly is due to general factor linking mental activities but there is power of thinking abstractly which is intelligence. It is being steadily lost by the selective power of differential birth rate.—A. R. Middleton.

16388. Valaoras, V. G. (Athens U., Greece.) Some effects of famine on the population of Greece. *Milbank Memorial Fund Quart.* 24(3): 215-234. 7 fig. 1946.—Since civil registration of vital statistics was the first administrative procedure to be paralyzed immediately after the occupation of Greece, exact measurement of famine losses will probably never be ascertained with any degree of accuracy. The author estimates the total loss because of lack of essential food to be about 450,000 persons. The acute manifestations of famine lasted from May, 1941, to April, 1943, affected ♂ adults more than women and children, and it was not complicated by any severe epidemics or unusual incidence of other diseases. A 2d portion of the report deals with post famine somatometric data on children as letd. by surveys in Athens and Piraeus. In 1942-43 children were somewhat taller but weighed less than in similar surveys in 1927-28. In 1945 av. heights had decreased in all children and at ages 12-14 were less than similar groups in 1927-28.—E. K. Kline.

16389. Whelpton, P. K., and Clyde V. Kiser. Social and psychological factors affecting fertility. VI. The planning of fertility. *Milbank Memorial Fund Quart.* 25(1): 103-111. 3 fig. 1947.—Among the population included in his study (previously described), 91.5% of the couples made planned attempts to control fertility either by limiting size of family or by spacing children at wanted intervals resulting in an estimated reduction in pregnancies and live births of 0.4%.—E. K. Kline.

16390. Woodside, Moya. Courtship and mating in an urban community. *Eugenics Rev.* 38(1): 29-39. 1946.—This is a study by personal separate interview of 151 husbands (half neurotic, half general patient soldiers) and 125 of their wives, artisan and working class people. As a picture of family life among these people it is what might have been anticipated. Almost every intelligent person has known or heard of similar histories. There was a high rate of pre-natal and extra-marital sex experience, with a fairly general acceptance of the "double standard." There is a widespread desire for accurate sexual knowledge. It developed that many working-class people cannot use or pronounce the correct terms for their sexual anatomy and for reproductive processes and, to avoid appearing obscene through use of other terms, are prevented from instructing their children and desire that school training should include sex education. The author believes that if biology could be taught in all schools, and children and adolescents given sex education by well adjusted teachers with a positive ethical approach, there would be great increase in personal happiness.—A. R. Middleton.

#### BEHAVIOR

16391. Ellis, Robert S. (Pomona Coll., Claremont, Calif.) The "laws" of relative variability of mental traits. *Psychol. Bull.* 44(1): 1-33. 1947.—109 studies dealing with the relative variability of human traits are critically reviewed. Most of the "laws" of relative variability are not substantiated. The author finds that more complex, higher and more recently developed functions tend to be more variable. Practice usually reduces while fatigue and forgetting increase relative variability. Relative variability decreases with age until maturity and increases thereafter.—C. W. Telford.

#### ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

16392. Myerson, Abraham. (Boston State Hosp., Mass.) The alcohol dependent. *Quart. Jour. Stud. Alcohol* 7(3): 341-345. 1946.—The Four Horsemen of the daily grind are Anxiety, Disgust, Fatigue and Frustration. Men turn from these in diverse ways, since escape has many routes and need have no stigma of weakness. Some of these ways are good, as some absorption in the welfare of others, or hobbies bringing special knowledge and compensative skills. A man is an alcohol dependent not because he gets drunk occasionally, whether for celebration or escape, but when he turns reflexly each day to alcohol to overcome the everyday anxieties, disgusts, fatigues and frustrations, offsetting them with drink. Perhaps the essential loneliness of most lives breeds a good deal of dependent drinking. The need to keep up false fronts, maintain attitudes when ardor has dried, conceal what presses for revelation, reveal what is not honestly felt makes alcohol dependency understandable. In alcohol dependency the goal is still something apart from the drinking; the end is valid even if the means spells folly. This distinguishes it from alcoholism, wherein the end and means have become fused and the desire to drink has become an obsessive goal. Whether alcohol dependency leads to alcoholism is an important question requiring detailed study of the earlier ways of alcoholics. But whether or not this dependency leads to alcoholism it is an evil in itself. The art of fine living becomes coarsened and cheapened when its amenities and ordeals alike need the habitual and constant use of the drug alcohol.—Abraham Myerson.

16393. Raynolds, Randolph. Progress in the treatment of alcoholism. *Jour. Connecticut State Med. Assoc.* 11(3): 170-173. 1947.—The vigorous attacks on the alcohol problem both by lay and scientific groups indicate progress. Examples cited are as follows: "Alcoholics Anonymous" started in 1935 has now some 35,000 members and units in Canada, England, Sweden and Australia; Central office: Alcoholics Foundation, Inc., P. O. Box 459, New York 17, N. Y. This lay movement has won the respect and support of both scientists and practitioners. In 1937 The Research Council on Problems of Alcohol was organized and in 1938 made an associate society in the Amer. Assoc. Adv. Science. Its first report "Study No. 1" (360 pp.) became at once a source book and authoritative reference work. It is a model of a critical survey ("The Effects of Alcohol on the Individual" published under the title "Alcohol Addiction and Chronic Alcoholism." Yale U. Press, 1942.). In 1940 a Section on Alcohol Studies was set up in the Dept. of Applied Physiology of Yale and the Quarterly Jour. of Studies on Alcohol was established. This scholarly journal carries original articles and reviews current literature. Yale also has summer sessions of the School of Alcohol Studies which in 1946 had 161 students from 37 states, D. C. and Canada. The article concludes with a statement of what Conn. is doing as a State to prevent alcoholism.

#### MISCELLANEOUS

16394. Bunta, Emil. (Loyola U., Chicago.) The essentials of genius. *Illinois Med. Jour.* 91(1): 40-46. 1947.—A survey of the opinions of numerous scientists and writers as to what constitutes genius (32 refs. cited). Bunta considers first the statements in regard to incidence of frequency, the roles of heredity, environment, education and disease; then the psychological aspects of genius, including atypical genius (prodigies, "idiot savants," criminal genius, insane genius, etc.). The diagnostic criteria of genius are four primary qualities: Originality or inventiveness; disinterestedness or objectivity; universality; productivity. These 4 qualities are elaborated with various illustrations.

16395. Council on Physical Medicine. Tentative standard procedure for evaluating the percentage loss of hearing in medicolegal cases. *Jour. Amer. Med. Assoc.* 133(6): 396-397. 1947.—The method is outlined.

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Factors inducing polygamy and monogamy in game birds, 16559; Use of tools by birds, 18683; Feeding habits, cuckoo, 18687; Drumming flight of grouse, 18711)

16396. Birch, H. G. (New York U.), and G. Clark. (Yale U. Med. Sch., New Haven, Conn.) Hormonal modification of social behavior. II. The effects of sex-hormone administration on the social dominance status of the female-castrate chimpanzee. *Psychosom. Med.* 8(5): 320-331. 1946.—♂ and ♀ sex-hormone therapy was employed on castrate ♀ chimpanzees to provide information on the direction and persistence of hormonally-induced modifications in social dominance-subordination relationships. Estrogen ( $\alpha$  estradiol, Progynon DH), 2 mg./day, and methyl testosterone (Oretin-M), 50 mg./day, were administered orally or by implanted pellets on 4 exptl. days separated by a 3-week control period. Dominance-subordination was studied by a competitive reaching for a single nut placed in a cup while the given experimentally paired animal was looking on. Ten test trials were interspersed with 10 free-feeding trials introduced to control the motivational differences between the animals. Both estrogen and androgen improved the dominance status of a previously subordinate castrate ♀, reversing the social relationship reliably in both drug conditions. Androgen was shown to have a more persistent effect and was unrelated to the tumescence-detumescence cycle.—B. F. Riess.

16397. Blair, Albert P. (U. Tulsa, Okla.) The male warning vibration of *Bufo*. *Amer. Mus. Novitates* 1344: 1-5. 2 pl. 1947.—♂ sex-warning vibration frequency was detd. for 7 spp. of *Bufo*. To a considerable extent vibration frequency is indicative of taxonomic relationship. Warning vibration is not always effective in securing release in inter-specific clasping of ♂♂ by ♂♂.—A. P. Blair.

16398. Frisch, Karl v. Die Sprache der Bienen und ihre Nutzenanwendung in der Landwirtschaft. *Experientia* 2(10): 1-21. 1946.—If honey-bees find a feeding place, after returning they report the discovery by dancing. The species of flower from which they are coming is indicated by means of the flower's scent adhering to their bodies, and also by the scent of nectar brought into the hive within the honey-stomach. After a long flight the scent adhering to the cuticular surface diminishes, but the scent within the honey-stomach changes little. Therefore the scent of nectar is especially important if the feeding place is far away from the hive. Bees dance only if there is plenty of food. The aroused bees are specifically set in some way for flowers having the scent indicated by the dancing bees. In this way the number of visiting bees increases in time, and the nectar becomes scarce. Although honey collecting is continued under these conditions, there is no more dancing in the bee-hive and the number of aroused bees does not increase. Hence there prevails a distinct relation between the total amount of nectar and the number of collecting bees. If the feeding place is at a distance of some hundred meters, there are many bees foraging at that distance but only a few working near the hive. By studies with an observation-hive the problem was solved. Bees collecting at a feeding place nearer than 50 to 100 m. made round-dances; bees coming from a feeding place more distant made a wag-tail dance upon returning to the hive. The wag-tail dance not only causes the aroused bees to go to distances greater than 50-100 m., but it also

may control the distance of their flight rather exactly through the number of turnings. (This contradicts v. Frisch's own earlier analysis of the meaning of the dances.) Moreover the way to the feeding place is somehow indicated by the direction of the straight run. Our knowledge about the "language" of bees can be used for leading bees to certain flowers for which more visits by bees are desired. In this way the pollination and therefore the crop of red clover and other plants has been improved (on the average about 40%) and the honey-production has been increased.—A. D. Hasler.

16399. Grant, Chapman. Kaleidoscopic color changes in beetles. *Jour. Ent. and Zool.* 38(4): 55. 1946.—*Europepla sebastana*, for a brief period after emergence as an adult, exhibits rapid changes in ground color as well as a shifting in the position of spots.—C. E. Abbott.

16400. Schneirla, T. C. (Amer. Mus. Nat. Hist., N. Y. C.) Problems in the biopsychology of social organization. *Jour. Abnormal and Social Psychol.* 41(4): 385-402. 1946.—The "superorganism" concept involves merely a preliminary and descriptive approach to the study of animal societies, in which similarities are emphasized. A most significant similarity which greatly deepens the study is the phenomenon of "trophallaxis" (Wheeler), involving the varieties of stimulative interchanges among individuals which insure social turning-toward responses. Although basic to group structure from insects to man, this cannot be regarded as the same factor on different levels. Although initially physiological, its eventual role in group cohesion on the "psycho-social" (human) level depends upon factors influencing selective learning, as through culture and social heritage, in contrast to the genetically presented factors which canalize and restrict the entire course of social patterning on the "bio-social" levels (e.g., insects). Thus very different biological and psychological factors influence the rise of a group pattern from the trophallactic basis on different social levels. Far-reaching differences exist in the psychological nature of communication, social function, and the role of learning in insects and man, which militate fundamentally against the validity of "superorganism" doctrine and make doubtful its thesis that natural selection operates in the same way on different levels of organization. The "dominance" concept, particularly when it refers to aggression dominance, is not fundamental for the understanding of group organization. Actually it has much more to do with factors promoting separation and schism, emphasizing social distance, than with conditions underlying group unity and social approach.—T. C. Schneirla.

16401. Treat, A. E. (Coll. City of New York.) The homing of pigeons following decompression to an indicated altitude of 25,000 feet. *Biol. Rev. Coll. City of New York* 9(1): 30-34. 1947.—38 homing pigeons were subjected to a total of 80 exptl. bird-runs in a standard AAF altitude chamber. Following exposure to an indicated altitude of 25,000 ft. for a period of 20 min. without O<sub>2</sub>, moderate impairment in homing ability was observed. Variation among individual birds was great. There is some evidence that either anoxia or ear disturbances, or both, may contribute to the impairment of homing performances.—A. E. Treat.





# ECOLOGY

Editors

ORLANDO PARK, *General Animal Ecology*

G. D. FULLER, *General Plant Ecology*

G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL AND ANIMAL ECOLOGY]—Kaleidoscopic color changes in beetles, 16399; Biopsychology of animal communities, 16400; Marine ecology, 16473; Starfish, 16474; Survival of frozen oysters, 16523; Computing rate of increase, deer, 16555; Overpopulated deer ranges, in the U. S., 16560; *Lymnaea stagnalis*, 18548; Lepidoptera, 18616, 18618; of Finland, 18619; Finches, Galapagos Is., 18683; Nest-loving birds, 18694; Birds of Hungary, 18708; Opossum in Missouri, 18731. [PLANT ECOLOGY]—Mountain algae, Finland, 17915; Irrigated oases, USSR, 18067; Factors affecting growth and summer dormancy of kok-saghyz, 18171; Forest communities of the Balkans, 18180; Germination of *Phacelia* seeds, 18247; Phenology of New Zealand plants, 18423)

## GENERAL

16402. Rasmussen, R. Vegetationen i de faerøske Fuglebjærg og deres naermeste Omgivelser. [The vegetation of the Faeroe bird cliffs and their surroundings.] *Bot. Tidsskr.* 48(1): 46-70. 2 fig. 1946.—After trips to the Faeroes (Nolsø, Trøllhøvd, Mykines, Fuglø, and Vaagø) in 1924-26 and 1936, the author gives examples, in the form of excursion reports, of the vegetation of localities, mostly difficult of access, which are inhabited by colonies of *Fratercula arctica*, *Puffinus anglorum*, fulmars, Sular, and other birds. The 2 groups of bird cliffs (Valling with more or less mould, which allows the occurrence of phanerogams, and Metilberg without any mould, where cryptogams are accordingly predominant) are characterized in detail and subdivided. Many phanerogams are mentioned, especially *Festuca rubra* var. *fraterculae* which is repeatedly mentioned with a description of characteristic localities.—*Sigurd Olsen*.

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: New journal, 16246; Climate and spermatogenesis, Rana, 16329; Soil freezing and thawing—effect on soil properties and vegetation, 16439; Phenology and climate, Denmark, 16465; Determining ocean waves and swell, 16476; Climate and survival of game birds, Penna., 16559; Humidity and sleep in relation to oxygen consumption in rats, 16742; Seasonal variations in Vit. A and carotene of butter, 16811; Clothing in relation to solar heat load, 16903; Cold environments in relation to human vasomotor mechanisms, 16905; Effect of clothing on ability of men to work in intense heat, 16906; Periodicities in reproduction, 17035; Meteoropathologic analysis of drug intoxication, 17205, 17268, 17271; Adaptability of cattle to the tropics, 17473; Poliomyelitis, 17674; Climate and soil properties, 18056; Weather injuries to fruit and fruit trees, Virginia, 18087; Climate and grape culture, Moravia, 18127; Weather and potato psyllid populations, North Platte Valley, 18355; Phenology of New Zealand plants, 18423)

16403. Angervo, J. M. Eine neue Klimakarte der Erde nach der Köppenschen Klassifikation. [A new climatic world map following the Köppen classification.] *Helsingfors Met. Zent. Anst. Mitt.* 23: 1-15. 1944.

16404. Berg, H. Der Einfluss eines Grosstadt auf Bewölkung, Niederschlag und Wind. [Influence of a large city on cloudiness, precipitation, and wind.] *Bioklimatische Beiblätter* 10(2/3): 65-70. 1943.

16405. Bertrand, G. Origine multiple du magnésium de l'eau de pluie. [The multiple origin of magnesium in rain water.] *Compt. Rend. Acad. Agric. France* 30: 418-420. 1944.—The ratio of Mg to Ca being about 0.1 in Paris rain water, and that in calcareous rocks nearby being  $< 1/10$  as much, dust cannot account for the Mg in rain. An oceanic droplet origin is therefore invoked to account for the greater part of the Mg of rain water.—*Courtesy Soils and Fertilizers*.

16406. Bertrand, G. Le potassium dans l'eau de pluie. [Potash in rain water.] *Compt. Rend. Acad. Agric. France* 31: 432-434. 1945.—After exclusion of sources of error it is concluded that appreciable amts. of K (0.2-0.4 mg. per l.) occur in rain in the neighborhood of Paris. Details of collection and analytical procedure are recorded.—*Courtesy Soils and Fertilizers*.

16407. Chaptal, L. Contribution à l'étude de la tem-

pérature de l'air dans les couches inférieures de la biosphère. [Contribution to study of air temperature in lower layers of the biosphere.] *Ann. Agron. [Paris]* 13: 427-437. 1943.—Comparison of actinothermic indices with observed air temps.—C. N. R. S. (courtesy *Bull. Amer. Meteorol. Soc.*).

16408. Hénin, S., et al. Sur une relation entre la pluviosité, le drainage et l'évaporation. [The relationship between precipitation, drainage and evaporation.] *Compt. Rend. Acad. Sci. [Paris]* 219: 80-82. 1944.—Relationships (in agreement with the exptl. results) allow the construction of precipitation-evaporation and precipitation-drainage curves. Analogy between these curves and those which relate the volume of water in rivers to precipitation in their basins.—C. N. R. S. (courtesy *Bull. Amer. Meteorol. Soc.*).

16409. Hutchinson, F. W. The solar house: A research progress report. *Heating and Ventilating Mag.* 43(3): 53-57. 1946.—Presents results of study of use of solar radiation in house heating at Purdue Univ.—*Courtesy Bull. Amer. Meteorol. Soc.*

16410. Kalitin, N. N. On scattering of radiation by clouds. *Compt. Rend. (Doklady) Acad. Sci. URSS* 43: 289-291. 1944.

16411. McLeod, J. A. (U. Manitoba), and J. McLintock. (Dept. Health Publ. Welfare, Winnipeg, Man.) Anophelism and climate in relation to malaria in Manitoba. *Canadian Jour. Res. Sect. E. Med. Sci.* 25(1): 33-42. Map, 1947.—The return of armed services personnel plus prospect of an influx of immigrants and tourists from malarious regions of the world has raised the question of the possibility of malaria becoming epidemic in Canada. In Manitoba no indigenous malaria has ever been reported, but the recent influx of carriers has awakened widespread interest in the anopheline fauna of Canada. Recent surveys indicate that anophelines are more abundant in Manitoba than was generally supposed. The anopheline records from the Province are summarized and observations on the distribution, habits, and larval habitats of *Anopheles maculipennis occidentalis* are reported. It is sufficiently abundant and widespread in its distribution to be important as a potential vector, but its efficiency as a vector has not yet been detd. The evidence suggests that, in Manitoba, this mosquito chooses a variety of overwintering habitats both indoors and outside and that not all locations chosen are favorable. The climate of Manitoba in relation to malaria is discussed briefly with a chart of the isotherms for the mean summer temps. This shows that a large portion of southern and western Manitoba, where about 90% of the human population lives, lies on the warmer side of the 61° isotherm.—*Auth. abst.*

16412. Manley, Gordon. Problems of Scottish climatology. *Scottish Geogr. Mag.* 61: 73-76. 1945.

16413. Matthes, F. E. The glacial anticyclone theory examined in the light of recent meteorological data from Greenland. I. *Trans. Amer. Geophys. Union* 27(3): 324-341. 3 fig. 1946.—The glacial anticyclone theory is today still the only definitely formulated theory concerning the atmospheric movements occurring over an ice sheet of large extent. In this paper the author first analyzes the theory and then presents the facts of observation now at hand—especially those reported from the fixed meteorological stations maintained in the interior of Greenland during the 1930's. In this, the first part of the paper, the meteorological data from Eismitte station of the German Wegener expedition are reviewed; the 2d part is to cover the aerological data of that

expedition and similar material from other ice-cap stations. The conclusions reached are that there is now no evidence of a virtually permanent "glacial anticyclone" centered over the Greenland ice sheet; on the contrary, there is consistent evidence from all parts of Greenland that the weather over the ice sheet is controlled by alternating cyclonic and anticyclonic movements. Cyclonic activity is most intense in southern and weakest in northern Greenland. The entire ice sheet is supplied with snow brought by rising maritime masses, not by air descending from the upper troposphere. There is not so much as a 50:50 chance of meeting good weather over central Greenland, except for a few weeks in mid-summer.—*Courtesy Expt. Sta. Rec.*

16414. Mörikofer, W. Die Entwicklung der medizinischen Klimatologie in der Schweiz. [Development of medical climatology in Switzerland.] *Schweiz. u. Forsch.* 1(4/5): 334-356. 1942.

16415. Mörikofer, W. Aktuelle Aufgaben und Anforderungen der Kurortklimaforschung in der Schweiz. [Actual problems and claims of climatic health resort research in Switzerland.] *Schweiz. med. Wochenschr.* 73(31): 939-947. 1943.

16416. Mörikofer, Walter, und Gertrud Perl. Meteorologische Gesichtspunkte zur Beurteilung der Einflüsse von Klima und Witterung auf den menschlichen Organismus. [Meteorological viewpoints in judging the influence of climate and weather on the human organism.] *Helvetica Physiol. Pharmacol. Acta Suppl.* 3: 15-25. 1944.

16417. Mörikofer, Walter. Beziehungen zwischen Witterung und Befinden. [Relations between weather and health.] *Schweiz. med. Wochenschr.* 75(15): 333-337. 1945.

16418. Nägler, W. Thermische Eigentümlichkeit an Talstationen. [Thermal peculiarities of valley stations.] *Zeitschr. angew. Meteorol.* 60(11): 374-375. 1943.—Increased continentality of valley station with 19.2°C annual variation, as against 13.6° on the summit, and -30.4°C, absolute minimum, as against -21.6° on the summit.—C. N. R. S. (courtesy Bull. Amer. Meteorol. Soc.).

16419. Neis, B. Albedo und Klima. [Albedo and climate.] *Meteorol. Zeitschr.* 61: 123-133. 1944.—A relation between temp. variation and the albedo of the atmosphere is set up. Thence, values for temp., humidity, and perennial-snow limits for the glacial period are deduced, in agreement with A. Penck's data.—C. N. R. S. (courtesy Bull. Amer. Meteorol. Soc.).

16420. Nicolet, M. Introduction à l'étude des relations entre les phénomènes solaires et terrestres: Le soleil. [Introduction to the study of the relations between solar and terrestrial phenomena: The sun.] *Misc. Inst. Roy. Meteorol. Belgique* 11: 1-138. 1943.—Contents: visual, photographic, and spectroscopic observation of the solar surface, the spectroheliographic observation of the solar atmosphere; observation of the chromosphere, protuberances, spectroheliographic observation of solar eruptions, observation of corona; the problem of relations between solar and terrestrial phenomena, the action of the sun on the terrestrial atmosphere, the effects of radiation, sudden fading, theoretical problems, magnetic and ionospheric storms, bibliography (p. 129-138).—*Courtesy Bull. Amer. Meteorol. Soc.*

16421. Nicolet, Marcel. Le rayonnement solaire et son activité biologique. [Solar radiation and its biological activity.] *Misc. Inst. Roy. Meteorol. Belgique* 18: 1-16. 1945.

16422. Oksanen, Kaino W. Karten über die Gewittertage. [Charts showing thunderstorm days.] *Helsingfors Met. Zent. Anst. Mitt.* 21: 1-24. 1940.—Geographical distribution of thunderstorm days in Finland, 1837-1936. A table shows the mean number of days for each station for each month, and for the year. Nine maps of Finland show the mean number of days for the seasons, Jan.-Apr. and Oct.-Dec., for the months May, June, July, Aug., Sept., for the year, and finally for each of the years, 1908-17. A short bibliography, explanation of data, etc., are included.—C. C. (courtesy Bull. Amer. Meteorol. Soc.).

16423. Passecker, R. Klimagrenzen für den Obstbau. [Climatic limits for fruit-tree growing.] *Kärntner Bauern* 1946(23): 1-4. 1946.—It is concluded from climatic data that in Austria, as a general rule, a July temp. of about 14°C and a mean annual temp. of 4.5°C are the limits to

which cultivation of native fruit-tree vars. is possible under otherwise favorable habitat conditions and with the usual care, without excluding certain cases of fruit-tree growing in rougher mountain situations. Low winter temps. are limiting nowhere in Austria provided the other factors are favorable (warm summer and good soil), but a hard winter combined with a cool summer is unfavorable. Other important factors are duration and intensity of sunshine, and precipitation, of which too much as well as too little can be a hindrance to fruit-tree growing.—*Max Onno.*

16424. Poncelet, L. Les caractères principaux de la température et de l'humidité de l'air en Belgique. [The principal characteristics of the temp. and humidity of the air in Belgium.] *Misc. Inst. Roy. Meteorol. Belgique* 22: 1-32. 1946.

16425. Prohaska, Fritz. Die Globalstrahlung in Davos. [Global radiation in Davos.] *Beitrage Geophys.* 59(3/4): 247-275. 1943.—The climatological results of 6 years of records of the total incoming radiation of sun and sky on the horizontal surface at Davos, as registered by the Robitzsch actinograph, are discussed in detail, especially the climatological mean and extreme values, and the conditions of radiation on clear days and on days without any sunshine. The relation between the total radiation and the relative duration of sunshine, as determined by Ångström, is examined, and the Ångström equation is found valid also for a high mountain station, with a much greater coefficient, however. The values of the total radiation, as recorded by Dorno at Davos during one year, are compared with the new mean values for 6 yrs., and it is found that Dorno's results cannot be regarded as representative for the climate of Davos.—*Auth. summ. (courtesy Bull. Amer. Meteorol. Soc.).*

16426. Rudder, B. de. (U. Kinderklin., Frankfurt a.M., Germany.) Die Wetterauslösbarkeit der akuten Poliomyelitis. [Effect of weather on poliomyelitis.] *Klin. Wochenschr.* 20: 561-564. 2 fig. 1941.—The author applies the "n-method" of Ortmann (*Virchow's Archiv* 291: 234. 1934), Düll (*Ibid.* 293: 272. 1934) and Gündel and Hoelper (*Balneologie* 333: 1935) to the statistical-bi-climatic analysis of the relationship between poliomyelitis and weather. Such a method with its tests of statistical significance gave, for the clinical data of Petersen and Benell (*Bioklimat. Beibl.* p. 160, 1935) for America, good statistical evidence of positive relation between cold-front passages and onset of poliomyelitis and paralysis. But in Hesse, with the same method, this relation was hardly evident during the polio epidemic of 1938-1939 (129 cases). No relation exists between front passages and diphtheria (266 cases), but a statistically sound one between cold fronts and angina pectoris (64 cases). This great mathematical and statistical analysis of de Rudder allows the extraction of the maximum information out of the clinical observations.—*J. Tripod.*

16427. Smith, H. V. The climate of Arizona. *Bull. Arizona Agric. Expt. Sta.* 197. 1-112. 14 fig. 1945.—In 1930 a compilation of weather records for the State was published; at that time there were about 90 cooperative stations assisting the U. S. Weather Bureau in recording observations for the area. The present contribution reports figures ending in 1940 from over 175 cooperative Arizona stations and values from over 40 stations established since that date. The textual matter (pp. 1-32) includes discussions of the climate, temp., length of growing season, precipitation over the State, at the university, and at 222 stations, rainfall intensity records, snowfall, relative humidity, sunshine, wind, evaporation climate in relation to comfort, health, and agriculture, and irrigated agriculture. The remainder of the bulletin is taken up with some 27 tables presenting detailed statistics of all phases of Arizona weather and climate.—*Courtesy Expt. Sta. Rec.*

16428. Stockmann, W. B. Un essai d'analyse qualitative des conditions de température dans la région de Kuroshio. [An attempt at qualitative analysis of temp. conditions in the region of the Kuroshio.] *Compt. Rend. (Doklady) Acad. Sci. URSS* 46(2): 56-59. 1945.—Variations of temp. of Kuroshio with time and depth. Analytical interpretation.—C. N. R. S. (courtesy Bull. Amer. Meteorol. Soc.).

16429. Stoker, R. L. A method of determining the size of droplets dispersed in a gas. *Jour. Applied Physics* 17(4): 243-245. 1946.—A method for determining droplet sizes in the interior of an already existing atmosphere of fog or mist

is developed and described; makes use of the fact that if droplets strike a suitably coated surface without wetting the surface, a track of the contact area is formed. A criterion is derived and experimentally evaluated for relating the droplet diameter and the track diam. An apparatus for utilizing this method is briefly described.—*Auth. abst. (courtesy Bull. Amer. Meteorol. Soc.)*.

16430. Vandenplas, A. La pluie au Congo Belge. [Rain in the Belgian Congo.] *Bull. Agric. Congo Belge* 34: 275-396. 1943.—Preliminary study of rainfall with a view to furnishing information of immediate use in the fields of agriculture, hydrography, and public works (14 tables and 14 maps).—*C. N. R. S. (courtesy Bull. Amer. Meteorol. Soc.)*.

16431. Waldram, J. M. Measurement of the photometric properties of the upper atmosphere. *Trans. Illuminating Engineer. Soc.* 10: 125-130, 147-187. 1945.—Visibility is affected by atmospheric conditions, especially scatter of the light and attenuation, the latter being a combination of absorption and loss by scattering. The scatter produces a veil of brightness over the object to be seen. The author describes measurements of these effects carried out in and from aircraft traveling at various heights, (a) in a clean atmosphere and (b) in the presence of industrial haze. For measuring scatter a polar nephelometer was used and this is fully described. For air to ground transmission measurements a telephotometer was used on the aeroplane. The results obtained are described in detail and discussed.—*Courtesy Phys. Abst.*

#### ANIMAL

16432. Alpatov, V. V. Vzaimopomoshch nasekomikh i entomofilnikh zasteniy kak chastnyy sluchay mezhduvidovogo simbioza. [The mutual help of insects and entomophilous plants as an example of interspecific symbiosis.] *Zoologicheskii Zhurnal* 25(4): 325-328. 1946.—This is an attempt to consider the pollination of some cultivated plants by honeybees as a case of interspecific symbiosis. A review of literature beginning with Darwin's "Origin of Species" leads to the conclusion that there exists a very close relation between the red clover and some bee races. The mutual help of honey bees and the red clover is stronger in the case of the long-tongued Caucasian and Ukrainian race than in case of the northern short-tongued race. This conclusion is opposed to a current opinion originated by A. F. Gubin that all bee races are equally able to pollinate the red clover without any relation to their tongue length.—*Auth. summ.*

16433. Fuhr, Irvin, and Seymour D. Silver. (Edgewood Arsenal, Md.) Simulated burrow systems for studies with rodent pests. *Jour. Wildlife Management* 11(2): 150-153. 1947.—Two different types of systems are descr. One was made of tubular sections of wire screen fastened together, laid on the ground, and covered with soil. The system had 4 entrances and an observation chamber. This type can be made practically any size and shape. The second system consists of 3 straight connecting shafts dug into the ground by means of a fence post auger. It had 3 entrances each covered by a glass window. These burrows were used to determine the persistence and toxicity of fumigants and the behavior of animals exposed to them. The feeding, nesting, and breeding habits of burrowing animals can also be studied by their use.—*Irvin Fuhr.*

16434. Ghigi, Alessandro, e Francesco Pio Pomini. L'importanza biogeografica della regione Garganica. [Biogeographical importance of the Garganic region.] *Boll. Zool. [Turin]* 12(1/2): 73-75. 1941.—Systematic faunistic research in the Garganic area has yielded abundant material. Preliminary results indicate a faunistic affinity of this territory to eastern Europe.—*I. L. Coiffmann.*

16435. Laurie, E. M. O. (Oxford U., Eng.) The reproduction of the house-mouse (*Mus musculus*) living in different environments. *Proc. Roy. Soc. Ser. B: Biol. Sci.* 133(872): 248-281. 6 fig. 1946.—A total of 8,207 wild mice were obtained over a 12-month period using break-back traps in urban buildings (U), meat cold stores at temp. -10 to -21°C (C), and unheated flour warehouses (F), and using nets in grain ricks (R) at threshing time. Mice bred throughout the year, without significant seasonal differences, averaging 7.6 pregnancies and 5.6 embryos per pregnancy. Males averaged 44.6% of population in ricks as compared to 50.1%

in other environments, there being no significant seasonal variation in sex ratio. Environment influenced 'reproductivity': % of fecund ♀ pregnant, U 21.9, C 26.5, F 31.7, R. 40.6; number of litters per year, U 5.5, C 6.7, F 8.0, R 10.2; number of embryos per yr., U 30.9, C 42.6, F 44.6, R 57.2. A skin disease characterized by a thin pelage, bald patches and crumpled ears, which was noted in mice from the flour warehouses, may be due to nutritive deficiency on a flour diet. Although temporary, the grain ricks were the most favorable habitat, population density reaching 0.43 per cubic ft.—*E. H. Shaw, Jr.*

16436. Ries, Julius von, und Marie A. Ries-Imchanitzky. (Intern. Biol. Sta. "Aquarium", Naples, Italy.) Lichttod und Lichtausstrahlung. *Radiol. Clin. [Basel]* 9: 257-298. 10 fig. 1940.—The authors' assumption that transparent animals (Ctenophora and Medusae) are extremely suitable for photo-biological expts. was verified in *Rhizostoma pulmo*, *Beroe ovata*, *Pelagia noctiluca* and *Nematostella munitis*. Normally these spp. are not affected by the light since their clear bodies allow unrestricted passage of rays. Their coloration during life suggests the possibility that these spp. are forced to absorb certain rays. Thus these violet-, blue-, or green-colored "glass-animals" absorb the long-waved red-yellow heat rays which cannot harm them when surrounded by cool water. On the other hand, the red-colored animals absorb the short-waved, chemically most effective light causing sudden "light-death", as a consequence of the absence of pigment protection. The shining of different living ctenophores and medusae compared with the phosphorescence phenomena of inanimate bodies suggests that bioluminescence can be divided into 2 groups:—(1) Phosphorescence of ctenophores is increased by u.-v. light, while red rays extinguish it immediately; (2) on the contrary, the light of the medusae shines like a light-substance, the phosphorescence of which is stimulated continually by radium and, therefore, cannot be extinguished by red exposure. In opposition to phosphorescence, there is no need of pre-exposure in bioluminescence; that is, on any kind of irritation the animal is capable of emitting light in complete darkness.—*H. Simons.*

#### PLANT

16437. Albertson, N. (Växibiologiska Inst., Uppsala, Sweden.) Österplana hed. *Acta Phytogeographica Suecica* 20: 1-267. 16 pl. 1946.—Alvar is the popular term for a steppe-like vegetation type on very shallow soil on flat limestone outcroppings in the island Öland in the Baltic. Österplana hed is a corresponding area in Västergötland (southwestern Sweden). There are transitory types to ordinary meadows on limestone soil. Grazing, etc., contribute to the alvar-like appearance—on the other hand afforestation has destroyed many alvar areas. As compared with the Baltic alvars, those of Västergötland are floristically poor. Soil pH is generally ca. 7, on level ground sometimes slightly acid (extreme: 5.4; under an accidental *Polytrichum juniperinum* stand: 4.7). Frost-heaving of the soil is important for maintaining the alvar character, producing an irregular micro-relief with small hummocks. Some 100 pp. are devoted to a sociologic analysis of the vegetation. The natural climax vegetation is a forest type; discontinuance of grazing has started successions in that direction. The cultivation influences probably date back to late Stone Age. Another ca. 100 pp. are devoted to a discussion of and a list of the flora, which contains many rare plants, partly southern spp., partly northern-alpine. Calcicolous plants are prominent in the flora. The best known sp. from the area is *Arenaria gothica*, which is otherwise restricted to Gothland, to one locality in England and 2 in Switzerland. It represents a hapaxanthic biotype belonging to the *A. norvegica* group. The following alpine or arctic mosses have been found within the area: *Clevea hyalina*, *Rhytidium rugosum*, *Scorpidium turgescens*. The *Tortella* flora is discussed, and *T. rigens* is described.—*Knut Faegeri.*

16438. Allan, H. H. (Plant Res. Bur., Wellington, New Zealand.) Tussock grassland or steppe. *New Zealand Jour. Geogr.* 2(1): 223-234. 2 fig. 1946.—Climatologists, geologists and pedologists do not clearly understand what they mean when they refer to steppe and steppe areas. The botanists include an even wider range of vegetation types under the name of steppe: e.g., Swedish alvar, Hungarian pusztas, Iberian meseta, Ceylon patana, E. Indiesalang, drinn and



schih of N. Africa, veld of S. Africa, N. American prairies, Californian chaparral, loma of Peru, Brazilian campos, etc. All the botanical definitions of Steppe are too wide to be satisfactory. Allan suggests that the term steppe be abolished, and that instead Rubels' terms *Duriherbosa* and *Sempervirentiherbosa* should be employed.—V. J. Chapman.

16439. Anderson, H. W. (*U. California, Berkeley.*) Soil freezing and thawing as related to some vegetation, climatic, and soil variables. *Jour. Forest.* 45(2): 94-101. 1 fig. 1947.—An analysis of some freezing data taken under brush cover, a light grass cover, and in bare soil at North Fork, Calif., showed that the light grass cover decreased freezing depth, delayed the first occurrence of freezing, and advanced the date of the last freeze of the year, as compared with bare soil. There was no freezing in the brush-covered soil during the 5 yrs. of the study. Multiple regression analyses showed that freezing was quantitatively related to air and soil temps., cloud cover, soil moisture, and snow depth. The rate of thawing of frozen soil was related to solar radiation, air temp., soil temp., and cloud cover. It was calculated that in order to initiate soil freezing the minimum air temp. had to drop to 31.3°F over the bare soil, 29° over the grass-covered soil, and 14.1° in the brush. A snow depth on bare soil of 12.6 inches was calculated to be equal in effect to the brush cover without snow in preventing the start of soil freezing. Soil freezing was found to keep the surface soil wet by drawing moisture from deeper depths of the soil, resulting in high evaporation rates during rainless periods and rapid soil erosion during rainstorms.—H. W. Anderson.

16440. Böcher, Tyge W. Graes-Urte-Vegetationen paa Høje Møn. [Grassland communities of "Høje Møn."]. *Bot. Tidsskr.* 48(1): 1-45. 1946.—"Høje Møn" is the name given to the very hilly easternmost part of the island of Møn in the Baltic. The substratum consists of Cretaceous rocks, which are overlain by sand and clay. The paper contains a topographical description of the vegetation and a more detailed treatment of the plant communities. The most interesting areas lie behind the shore in the so-called Jydeleje and on the limestone hill Høvbølge. The vegetation is divided into 6 ecological main types: (1) Dry warm sandy soil, southern exposure; (2) Less dry sandy soil—often on flat land; (3) Slightly moist, cool, sandy soil on north-facing slopes; (4) Dry calcareous soil on south-facing slopes; (5) Less dry calcareous soil in depressions on flat land; (6) Slightly moist calcareous soil on north-facing slopes. Measurements of some microclimatic differences between north and south sides, and some water-content values are given. Large parts of Jydeleje were once cultivated. Accordingly, many of the vegetation types here may be regarded as stages in the succession: tilled field → grassland → juniper scrub → beechwood. The flora now occurring on the treeless areas may previously have grown in natural clearings in the forests caused by the sterile calcareous soils, by drought, or both. Special reference is made to the curious communities of south European introduced plants (*Bromus erectus*, *Linum austriacum*, etc.) on south-facing slopes. Phytogeographically the vegetation may be referred to 3 main types: Communities characterized by east European plants associated with forest-steppes and related vegetation; communities with south European dry-soil plants and continental steppe plants; and communities with a few montane or boreal plants and many widely spread meadow plants.—T. W. Böcher.

16441. Bogdanowskaya-Guiheneuf, Y. [Some fundamental problems in the study of bogs.] *Botanicheskii Zhurnal SSSR (Jour. Bot. URSS)* 31(2): 33-44. 1946.

16442. Braun-Blanquet, J. Über den Deckungswert der Arten in den Pflanzengesellschaften der Ordnung Vaccinio-Piceetalia. *Jahresber. Naturforsch. Ges. Graubündens* 80: 115-119. 1946.—Preliminary communication introducing an index of coverage as sociologic index in the classification of these neglected societies.—Knut Faegri.

16443. Buell, Murray F. (*Rutgers U., New Brunswick, N. J.*) A size-frequency study of *Pinus banksiana* pollen. *Jour. Elisha Mitchell Sci. Soc.* 62(2): 221-228. 1946.—Size-frequency curves derived from samples of Jack Pine pollen collected from herbarium specimens and treated by acetolysis indicate that the mode for the pollen of this species is somewhat greater than 40 $\mu$ . That such a species curve

has a mode at a point close to 43.2  $\mu$  is indicated by size-frequency curves of pollen obtained from young, green parts of moss plants collected in a Jack Pine forest. In an earlier study *P. serotina* pollen was shown to shrink during fossilization. If the curve for pine pollen in the mass, as a fair sample of the last pollen rain, represents a fairly true curve for the species, then fossil Jack Pine pollen likewise shrinks during fossilization. The data suggest that the shrinkage is proportional for the 2 spp. but the true modes must be more accurately approximated before a correction factor can be established.—M. F. Buell.

16444. Christiansen, M. Skytte. Lavfloraen paa det fredede Areal ved Strandkaer paa Mols. [The lichen flora in the native conserved area near Strandkaer in Mols.] *Bot. Tidsskr.* 48(1): 71-87. Map. 1946.—An enumeration of the lichens and lichen parasites found within a small nature-conserved area in eastern Jutland, totalling 202 spp. of lichens and 12 spp. of parasites.—J. B. Hansen.

16445. Curtis, J. T. The palo verde forest type, Haiti, and its relation to surrounding vegetation. *Caribbean Forester* 8(1): 1-25. 1947.—The palo verde forest type near Gonaives, Haiti, included *Cercidium praecox* and *Prosopis juliflora* as dominant spp. Ecologically the area contained the following units: The semi-evergreen seasonal forest formation (*Vilex-Lysiloma* association), the deciduous seasonal forest formation (*Bursera-Pseudophoenix* association), the thor woodland formation (*Phyllostylon-Prosopis* faciation), (*Prosopis-Acacia* association, *Cercidium-Prosopis* association) and the cactus-scrub formation (*Opuntia-Lemaireocereus* association).—L. J. Pessin.

16446. Duchaufour, Ph. Le sol et la flora forestière en quelques points des secteurs parisien et ligérien. *Rev. Eaux et Forêts* 84(12): 701-722. 1946; 85(1): 16-38. 1 pl. 1947.—The soils of this portion of France consist of 5 series: (1) Compact clays; (2) silts or sandy loams; (3) siliceous or gravelly loams; (4) sands; and (5) limestone soils. Typical soil profiles and the accompanying vegetation are descr. and the evolution of soils and vegetation is outlined. It is concluded that on soils of series (3) and (4), which are fairly permeable, ericaceous heaths ("landes") on podzols constitute a stable paraclimax, resulting from regressive evolution, but irreversible without the intervention of man in establishing forest associations. For series (1) the humid *Molinia* heath (and, locally, sphagnum bogs) seems to be an equivalent paraclimax. Series (2) may evolve, when the forest degenerates, into an intermediate type of heath, equally stable.—W. N. Sparhawk.

16447. Erdtman, G. Palynologiska synpunkter på pollenjärfasen i den svenska floras invandringshistoria. [Paleontological aspects of the pioneer phase in the immigration of the Swedish flora.] *Svensk Bot. Tidsskr.* 40(3): 293-304. 1946.—Some 50 yrs. ago it was thought that the climate and the vegetation of southern Sweden in Late Glacial times were much the same as they are in Greenland and Spitzbergen at the present day. Pollen-analytical investigations have so far not brought much new information on these matters. Preliminary pollen analyses from Late Glacial clays of the Lunda Bog in the alvar ("steppe") district of the island of Oeland, Sweden, have shown that certain main features of the present day pollen flora (caught by lichens and mosses growing on an erratic boulder in the middle of the alvar) can be traced as early as in the pollen flora of the Late Glacial sediments. Pollen grains of *Artemisia*, *Chenopodiaceae*, *Cyperaceae*, *Graminae*, *Helianthemum* and *Juniperus* form a characteristic weft in the Late Glacial as well as in recent pollen spectra. A certain interest is attached to the occurrence of *Artemisia* pollen, as it seems to have been confused earlier with pollen grains of *Salix*, *Fraxinus* and *Adoxa*, etc., and as it is rather often found in deposits from these times. The author draws attention to the fact that there is a certain parallelism between the occurrence of *Artemisia* and *Hippophae* pollen, and is of the opinion that these plants were among the first pioneers among the vascular plants, closely following in the traces of the ice cover up to northern Sweden. The alvar vegetation, at least in parts, thus probably presents a picture of the plant pioneers and vagabonds of the open vegetation first invading the country.—H. Horn of Rantzien.

16448. Hansen, Henry P. (*Oregon State Coll., Corvallis.*) Postglacial vegetation of the northern Great Basin. *Amer.*

*Jour. Bot.* 34(3): 164-171. 4 fig. 1947.—Pollen analyses of post-Wisconsin organic lacustrine sediments in the northern Great Basin of south-central Oregon reveal trends of post-glacial forest succession and climate consistent with those recorded in peat bogs throughout the Pacific Northwest. At the time of initial sedimentation the adjacent forests consisted largely of *Pinus monticola*, *P. contorta*, and *P. ponderosa*. *P. monticola* is predominantly recorded, suggesting a cool, moist early postglacial climate. As postglacial time progressed, warming and drying of the climate are denoted by an expansion of *P. ponderosa* and a contraction of the other 2 spp. Continued desiccation of the climate to a maximum between 8,000 and 4,000 yrs. ago was unfavorable for *P. ponderosa*, and it was partially replaced by grasses, chenopods, and composites. Increased moisture during the past 4,000 yrs. caused a resurgence of *P. ponderosa* and a contraction of the areas occupied by grasses, chenopods, and composites. The stratigraphic position of Mount Mazama pumice in sections from Warner Valley and Chewaucan Marsh indicates that Mt. Mazama erupted before the warm, dry period, but not more than 10,000 yrs. ago.—H. P. Hansen.

16449. Hessland, Ivar. (*U. Uppsala, Sweden.*) On the occurrence of subfossil Ceratophyllum submersum L. *Svensk Bot. Tidskr.* 40(3): 235-256. 2 fig. 1946.—The paper reports a find of subfossil *C. submersum* in Bohuslän (w. Sweden), situated about 3° N of the northernmost Swedish subfossiliferous locality of the sp. A reexamination of previous Swedish and Danish finds indicates that most of them are Atlantic. A few may be younger and some are apparently Boreal. The Bohuslän find is late-Boreal (pollen analysis). In Finland the sp. attained the highest frequency at the beginning of the Subatlantic period. It is difficult to settle the causes of the formerly wider distr. of the sp. Nevertheless, one may conclude that the most important cause was a good supply of appropriate nutritive substances, among them very possibly lime. The higher temp. in the Post-Glacial seems not to have played a decisive role.—H. Horn af Rantzien.

16450. Hinckley, L. C. (*Sul Ross State Coll., Alpine, Texas.*) Contrasts in the vegetation of Sierra Tierra Vieja in Trans-Pecos Texas. *Amer. Midland Nat.* 37(1): 162-178. 1947.—A study of the vegetation in the 50-mile range showed 3 rather distinct types. The eastern slope supports a grassland type, chiefly *Bouteloua* spp., with a thin oak forest, *Quercus grisea*, appearing on the north slopes of the higher points. The deep, well-watered canyons have maple, *Acer grandidentatum*, ash, *Fraxinus velutina*, and oak, *Quercus emoryi*, with some variety of other spp. of ligneous vegetation. The western side of the range, having considerably less rainfall, supports only desert shrub spp., cacti, mesquite, and cat's-claw.—L. C. Hinckley.

16451. Hou, H. Y. The plant communities of acid and calcium soils in southern Kweichow. *Nation. Geol. Surv. China Spec. Soils Bull.* 5: 1-75. 1944.—Soil reaction is one of the most important ecological factors determining the distribution of plant communities in this region. Lists of spp. found on different soil formations are given, also extensive lists of typical calcicoles and calcifuges. Climate and altitude also have dominant effects on the distribution of plant communities.—*Courtesy Soils and Fertilizers.*

16452. Krist, V. (*Masaryk U., Brno, Czechoslovakia.*) Halofytní vegetace jihozápadního Slovenska a severní části Malé uherské nížiny. [Halophyte vegetation of s.-w. Slovakia and the northern part of the little Hungarian lowland.] [In Czech with Ger. summ.] *Práce Moravské Přírod. Společnosti (Acta. Soc. Sci. Nat. Morav.)* 12(10): 1-100. 19 fig. 1940.—In the northern part of the little Hungarian lowland and in s.-w. Slovakia occur salt soils with interesting halophytic vegetation. The plants are divided into 3 groups: obligate halophytes, facultative halophytes and other plants which grow on the slightly saline soils. The soils are mostly of Solonetz type and rarely of the Solontchak type. From point of view of the vegetation the salt areas have the characteristic of salt steppe or salt meadows with *Festucetum pseudovinae*, *Camphorosma ovata* and *Puccinellia distans*. All areas of salt soils in this part of Europe with their typical vegetation are described in detail and the different characteristics of various localities are discussed.—B. A. Kvitkalo.

16453. Lemberg, Bertel. Studier över Stor-Pernåvikens strändvegetation. I. Stensträndernas vegetation. [Stud-

ies on the shore vegetation of Stor-Pernåviken. I. The vegetation of stony shores.] *Acta Soc. Fauna et Flora Fennica* 65(2): 1-177. Map. 1945/46.—After a general descr. of the geology, the influence of the current of water, ice and salinity a floristic survey accompanied by a list of spp. is given. A very detailed descr., illustrated by lists of spp., tables of spectra and frequency, is given of the plant associations which are integral parts of 1) the saline vegetation, composed of 75 spp., 2) the suprasaline vegetation, 109 spp., and 3) the supralittoral vegetation, 111 spp.—W. Rosén.

16454. Louis-Marie, Fr., and Alex. Dion. (*Inst. Oka, Prov. Quebec, Canada.*) La Florule de la commune de la Baie-du-Febvre, La Salicaire. VIII. IX. *Rev. Oka Agron. Med., Vet.* 18(3): 89-98. 1944; 19(1): 33-34. 1945.—List of plants with distribution collected in and around a large *Lythrum salicaria* formation described elsewhere.—Fr. Louis-Marie.

16455. Luther, Hans. Studier över den högre vattenvegetationen i Ekenäs skärgård. Pojoviken. [Aquatic vegetation of Ekenäs Skärgård. Pojo bay.] *Memoranda Soc. Fauna et Flora Fennica* 21: 3-15. 1944/45.—An account is given of the vegetation, the ecology and distr. of vascular plants, mosses and charophytæ accompanied by a list of spp. and localities.—W. Rosén.

16456. Lysdahl, E. Noen iakttagelser over blåveisen spredning ved maur. [Some observations on the dispersal of *Anemone hepatica* by ants.] *Blythia* 3(3/4): 85-88. 1945.—Fruits of *A. hepatica*, placed in an ant-path, were in some cases eagerly carried away by the ants, in other cases neglected. No explanation is offered.—Knut Faegri.

16457. Mason, Herbert L. (*U. California, Berkeley.*) The edaphic factor in narrow endemism. I. The nature of environmental influences. *Madroño* 8(7): 209-226. 1946.—The functioning of all plants is conditioned by environmental factors acting to control physiological processes. These relationships in each individual case are probably genetically fixed as to the nature and span of their tolerances. The fixation of the tolerance span may result from any of the isolating mechanisms of genetics that function to elaborate plants over the available habitats, each plant being restricted to the area of the condition to which its tolerances are suited. These dynamics apply to all plants, hence all plants are restricted in range and all plants are in a sense endemics. Restriction is purely relative and is always related to environmental factors through physiological and genetic processes. The relative age of species has little, if any, significance of a causal nature or as a symptom of endemism. Of those environmental factors most apt to occur in highly localized areas, edaphic factors are probably most significant.—H. L. Mason.

16458. Mason, Herbert L. (*U. California, Berkeley.*) The edaphic factor in narrow endemism. II. The geographic occurrence of plants of highly restricted patterns of distribution. *Madroño* 8(8): 241-257. Map. 1946.—A consideration of the so-called "endemism areas" of the world reveals that they are usually associated with volcanic or metamorphic rocks often rich in heavy metals or minerals that occur in concs. often lethal to crop plants. This is especially the case when highly restricted patterns of distribution prevail. A survey of the area of Napa and Lake counties in California reveals a striking correlation between highly restricted patterns of distribution and peculiar soil.—H. L. Mason.

16459. Moor, M. Die Waldpflanzengesellschaften des Schweizer Juras und ihre Höhenverbreitung. *Schweiz. Zeitschr. Forstw.* 98(1): 1-17. 3 fig. 1947.—The characteristic forest of the Swiss Jura is the beech type (Fagetum), but the author recognizes at least 14 other forest associations or types, which are descr. The altitudinal limits of the several types are 200-300 m. lower on n.-w. than on warm, dry, s.-e. slopes. Timber line is at about 1600 m. on both slopes, at the upper edge of the spruce type on n.-w. slopes and of the beech-fir type on s.-e. slopes.—W. N. Sparhawk.

16460. Naustdal, J. Flora og vegetasjon ved veksestader for *Carex diandra* i Fana. [Flora and vegetation in two *C. diandra* localities in F.] *Blythia* 3(3/4): 94-109. 1945.—*C. diandra* is rare in western Norway. In the 2 localities (near Bergen) the sp. occurs in a mesophytic community on bogs formed by the partial filling of small lakes (species lists

given), usually not along the edge of the water. The occurrence in the 2 localities close to each other may represent relicts from a previous more continuous distribution, suitable localities becoming increasingly scarce because of oligotrophication during the filling in. Alternatively, the sp. may be a recent immigrant; the localities are situated at low levels and have comparatively recently been isolated from the sea.—*Knut Faegri*.

16461. Pesola, Vilho A. "Kalkkikasvit" ja "pH-Kasvit". Hiukan vertailua. [The "calciphilous plants" and "pH-plants".] *Luonnon Ystäv* 1940: 42-48. 1940.—The author investigated the influence of  $\text{CaCO}_3$  on the distribution of higher plants in Finland (1928), dividing the plants into 6 groups on the basis of their response to the lime content in soil, from the very calcifilous group to the clearly calciphobe one. Later (1939) A. Pankakoski investigated the same problem on the basis of the pH condition of the soil. The results obtained by these 2 methods agree well, the calciphilous plants being identical with the "alkalophilous" or "neutrophilous" plants, the calciphobe plants identical with the "acidiphilous" plants. In the first case the main attention is paid to the geobotanic aspect of the problem, in the other case to the ecologic aspect.—*Auth. summ.*

16462. Pesola, Vilho A. Suomen kasvinviljelysalueet. [The natural growing regions in Finland.] *Suomen Maataloustieteellinen Seuran Julkaisuja (Acta Agr. Fenn.)* 47(1): 1-146. [1946].—Finland, lying between the 60° and 70° N., and being over 1000 km. long and with soils varying from a heavy clay to sand, can be divided on meteorological and edaphic bases into 12 natural regions, which are here described. Of these, 4 are great main crop regions, viz., the main region for wheat to ca. 61°30' N., the southern main region for rye (to ca. 63°), the northern main region for rye (to 65°), and the main region for barley (the northernmost part of Finland to ca. 68°). The aim of this book is to establish a basis for a rational cultivation in Finland of different crop plants and of different vars. and strains of each.—*Auth. summ.*

16463. Podpěra, J. (Masaryk U., Brno, Czechoslovakia.) Druhový výskyt stepní květeny na dolním Pomoraví. [The secondary occurrence of desert flora in a south Moravian valley.] [In Czech with Ger. summ.] *Sborník Klubu Přírodovědeckého Brno* 24: 83-88. 1941.—Two localities where plants of xerophil origin were found during former years, and the natural environmental conditions of these localities are discussed.—*B. A. Květa*.

16464. Schaeede, E. Über die Korallenwürzeln der Cycadeen und ihre Symbiose. [Coral roots of Cycads and their symbiosis.] *Pflanz* 34(1): 98-124. 7 fig. 1944.—Coralloid roots of *Cycas revoluta*, *Macrozamia spiralis* and *Zamia longifolia*, whether inhabited by Cyanophyceae or not, contain no bacteria. Those observed by previous authors were probably introduced from the outside by an imperfect technique. The differences between coralloid and normal root primordia are of histological and physiologic nature. Development of algal zone from particular initials is described. The mucus in the intercellular spaces inhabited by algae is a secretion of the host plant. In older parts of coralloid roots algae die off, along with a part of cortical tissue, by cork formation between host zone and endodermis. The conditions for free N assimilation by Cyanophyceae are not present in the coralloid roots, so that the host cannot profit in N by them, whereas the mucus is evidently important for the nutrition of the algae, which are thus innocuous parasites of the Cycads. Some fungi, probably Phycomycetes, were observed as further occasional inhabitants and innocuous parasites of coralloid roots. Their intracellular mycelium parts are digested.—*Max Onno*.

16465. Sørensen, Henning. Om Klimaets Indvirkning paa nogle Planter Udspringstid. [The influence of climate on the opening of buds of some plants.] *Bot. Tidsskr.* 48(1): 88-91. 2 fig. 1946.—A comparison between the effects of exposure on the north and the south side of a tumulus.—*J. B. Hansen*.

16466. Steenis, J. H. Recent changes in the marsh and aquatic plant status at Reelfoot Lake. *Jour. Tennessee Acad. Sci.* 22(1): 22-27. 1947.—Reelfoot Lake has been under intensive investigation since 1942 with reference to measures that may be used for improving this area for waterfowl. During 1945, a series of cloudbursts resulted in heavy flood of

silt loaded water that altered the lake vegetation. Both undesirable and desirable waterfowl plants were adversely affected or killed. Fortunately considerable growth of plants that previously had been suppressed by the more aggressive vegetation became abundant. These plants include the *Potamogeton*, *Najas*, and *Zannichellia* spp. that are classed among the better duck foods. Continued holding of the water at higher levels and control of the pad-leaf vegetation in the outer range of its growth will favor these plants.—*J. H. Steenis*.

16467. Wadsworth, F. H. Growth in the lower montane rainforest of Puerto Rico. *Caribbean Forester* 8(1): 27-43. 1947.—Diameter growth measurements of trees in montane rainforests in Puerto Rico revealed that the insufficient light was mainly responsible for the extremely slow growth of the suppressed trees and for the rapid growth of the dominants in the stand.—*L. J. Pessin*.

16468. Wiinstedt, K. (Bot. Mus., Copenhagen, Denmark.) Rømp's Vegetation og Flora. [The vegetation and flora of Rømp.] *Bot. Tidsskr.* 46(4): 303-346. Map. 1944.—The paper contains the following chapters: Topographical survey, Botanic-historical survey, Geological survey, and Plant communities. The last-mentioned chapter includes descriptions of the following communities: I. shallow-watered sandy areas; II. sea-dunes; III. sand fields; IV. dune heath; V. cultivated soil; and VI. marsh. Attention is called to the contribution of the ocean currents to the immigration of certain spp. to the island and to the occurrence of many spp. of an Atlantic character, on which account the vegetation is related to that of western Jutland. These spp. occur chiefly in the extensive *Calluna* heaths which constitute most of the island. The island will soon be connected by a dam with southern Jutland, so the immigration of spp. now absent, but common in other parts of Denmark, will probably take place. The plant spp. of the island (Cryptogams and Phanerogams) are collected in a flora list, in which the habitats are given.—*K. Wiinstedt*.

16469. Zangheri, P. Sguardo preliminare alla flora e vegetazione dell'alto Appennino romagnolo con particolare riguardo alla foresta di Campigna. [Preliminary report on flora and vegetation of the high Romagnol Appennine, with special study of the Campigna forest.] *Nuovo Giorn. Bot. Ital.* 49(2): 59-109. 1942.—Climatic conditions are analyzed. E.g., at the Hermitage of Camaldoli (alt. 1111 m.), the annual amt. of precipitation is 1735 mm., the annual av. temp. 7° C, and the absolute minimum -17° C. Then a list of tree spp. is given: *Picea excelsa* (introduced in 1835), *Abies alba* (re-introduced), *Taxus baccata*, *Carpinus betulus*, *Ostrya carpinifolia*, *Quercus robur* (vars. *sessilis* and *lanuginosa*), *Q. cerris*, *Castanea sativa*, *Fagus sylvatica*, *Celtis australis*, *Amelanchier ovalis*, *Ilex aquifolium*, *Evonymus europaeus*, *E. latifolius*, etc. The Campigna forest, located between the altitudes of 800 and 1600 m., covers a strip about 20 km. long and 1½ to 6 km. wide, on the Romagnol side of the Appennine. It includes typical *Fagetum*, with a spectrum: P 11, G 28, H 50, T 6, C 5. Its flora is hygrophilous, on deep humiferous soil, but including many glades with *Epilobium angustifolium*, *Chrysanthemum vulgare*, etc. Outside the limits of this handsome State forest, the surrounding mts. are badly denuded with impoverished flora.—*H. Prát*.

#### OCEANOGRAPHY

(See also 16486, 16498, 16512, 16523, 16524, 16525, 17530, 17917, 17921, 18519, 18520, 18521, 18522, 18533, 18534, 18535, 18536, 18537, 18538, 18542, 18543, 18544, 18545, 18551, 18552, 18554, 18654, 18662)

16470. Abe, N., M. Eguchi, and F. Hiro. Preliminary survey of the coral reef of Iwayama Bay, Palao. *Palao Trop. Biol. Sta. Stud.* 1(1): 17-35. Map, 2 pl., 1 fig. 1937.—Largely descriptive of the topography.

16471. Häyren, Ernst. Om vattnets flora i några städer vid Finska vikens nordkust. [The water flora at some towns on the north coast of Gulf of Finland.] *Memoranda Soc. Fauna et Flora Fennica* 21: 134-142. 1944/45.—An account is given of the vegetation and flora of polluted harbor water of 6 towns, accompanied by a list of spp. There were 77 spp. of Cyanophyceae, 42 green algae, 21 Bacteria, 26 Monocotyledones, and 12 Dicotyledones.—*W. Rosén*.

16472. Krasske, Georg. Die Kieselalgen des chileni-



schen Küstenplanktons. (Aus dem südchilenischen Küstengebiet. IX.) *Arch. Hydrobiol.* 38(2): 260-287. 1941.—Tow-nettings taken near the Chilean shore in 1928-29 and 1935-38 supplied a large number of pelagic and littoral diatoms, including *Thalassiosira minuscula*, *T. chilensis*, *Chaetoceros chilensis*, *C. subcoronatus*, *C. horridus*, *PSEUDOHIMANTIDIUM* Hust. et Krasske, *P. pacificum*, *Pleurosigma chilensis* Hust. et Krasske, *Amphiprora aculeata*, *Nitzschia incognita* and *Chaetoceros cinctus* var. *hirtus*. 2 spp., *Thalassiosira kryophila* (Grun.) and *T. hyalina* (Grun.), are reduced to synonymy under *T. decipiens*. Although the water is cool (12-19°C), diatoms occurred that are generally found in warm water of the sea. Antarctic spp. were missing, except *Chaetoceros diadadia*.—Ingo Findenegg.

16473. Ladd, Harry S. (Chairman.) (Nation. Res. Council, Washington, D. C.) Report of the Committee on Marine Ecology as related to Paleontology, 1945-1946. 101p. National Research Council: Washington, D. C., 1946. Pr. \$0.50.—This report contains an outline for a comprehensive Treatise on Marine Ecology and Paleontology that the Committee will prepare with the aid of interested specialists. Included also are reports of activities in marine ecology and paleoecology in various parts of the U.S. and in other regions. Four of these reports are annotated bibliographies of ecological studies that have been carried on in the Pacific area, the remainder are special ecological studies. Quotations are given from systematic studies made at Bikini Atoll in connection with the atomic bomb tests there. This report gives information on current and recently completed activities, together with a current bibliography and summary reviews.

16474. Loosanoff, Victor L. Effects of sea water of reduced salinities upon starfish, *A. forbesi* of Long Island Sound. *Trans. Connecticut Acad. Arts and Sci.* 36:813-833. 1 pl. 1945.—*Asterias forbesi* normally living in water of salinity about 27‰ can be permanently maintained in water of salinity 18‰ but not of salinity 16‰. Recovery is possible after short sojourns in water of lower salinity, e.g., for 12 hrs. at 14‰ and 1 hr. at 3‰. Field observations suggest that the animals react to and avoid low salinities. Attempts to acclimate starfish by slowly reducing the salinity below 18‰ failed.—G. E. Hutchinson.

16475. Wiborg, Kristian Fredrik. The production of zooplankton in a landlocked fjord. The Nordåsvatn near Bergen, in 1941-42. With special reference to the copepods. *Fiskeridirektoratets Skrifter Serie Havundersøkelser (Rept. Norwegian Fish. and Marine Invest.)* 7(7): 1-83. Map. 1944.—The Nordåsvatn is situated about 5 km. s. of Bergen, Norway. Its length is 5 km. and greatest width is 2 km. The only connection with the outer fjord is a narrow channel 10 m. wide, 30-40 m. long and 3 m. deep. There are 2 basins separated by a submerged ridge 12 m. deep. The outer basin is 45 m. deep and the inner one is 84 m. deep. In the inner basin the water layer below 15 m. may be stagnant for yrs. and usually contains H<sub>2</sub>S. In the outer basin the bottom water is renewed regularly once a year, but water below 20 m. may contain H<sub>2</sub>S. The surface layer is well aerated, with great changes in temp. and salinity during the yr. The 1941-42 observations on temp., salinity, and dissolved O<sub>2</sub> are discussed. The zooplankton is treated first as a whole. *Oithona* spp. constituted 60.1% and 6.2% in 1941 and 1942. The organisms that belong to the deeper water layers are excluded from the inner basin but may thrive in the outer basin. Only the organisms that belong to the upper 12-15 m. can live for long in the inner basin. The spp. discussed in detail are: *Calanus finmarchicus*, *Paracalanus parvus*, *Pseudocalanus minutus*, *Centropages hamatus*, *Temora longicornis*, *Acartia clausi*, *A. longiremis*, *Oithona helgolandica*, and *Oncaea subtilis*. Several others are mentioned. Other groups discussed are the Cladocera, Decapoda, Euphausiacea, Chaetognatha, Copelata, Polychaeta, larvae of bottom invertebrates, Coelenterata, Turbellaria, and fish eggs and larvae.—J. S. Dendy.

16476. Anonymous. Ocean waves and swell. *Nature* [London] 157: 165-166. 1946.—New methods have been developed for the continuous recording of wave motion in exposed sites using instruments lying on the sea bottom and connected to the shore by submarine cable. One instrument measures the pressure fluctuations below the waves, another is an inverted echo-sounder which records a profile of the surface. A semi-automatic analyser resolves the complex

record into its components, and enables early detection of the fast-traveling low long swell from a storm center? For example, swell with a period of 24 seconds from a depression 500 miles away was detected when only a few inches high.—*Courtesy Phys. abst.*

## LIMNOLOGY

(See also Entries 16496, 16501, 16545, 16546, 16550, 17530, 17957, 18518, 18525, 18531, 18532, 18539, 18579, 18580, 18581, 18585, 18648)

16477. Baldi, Edgardo. Condizioni spaziali della distribuzione del limnoplankton. [Distribution of limnoplankton.] *Boll. Zool. Agrar. e Bachicolt. [Turin]* 14(1/3): 5-32. 10 fig. 1943.—Researches carried out in Lago Maggiore showed that the mesoplankton is distributed in movable swarms, generally of the same species.—I. L. Cojmann.

16478. Berg, Kaj. (U. Copenhagen, Denmark.) Physiological studies on the river Susaa. *Folia Limnol. Scand.* 1. 1-174. 2 maps, 4 pl., 35 fig. 1943.—A physicochemical study of the principal river on the island of Sealand. The greater part of the river has a moderate or low rate of flow; the rivers of Sealand vary seasonably in this respect more than the rivers of Jutland. The mean drainage from the basin is 6.6 litres per sec. per km<sup>2</sup>, the greatest drainage occurs from Jan. to Apr. The water level is highest in winter and spring, when the velocity is high, but there is a secondary maximum with a low velocity in the middle of summer, when the growth of water plants retards the movement of water. Many areas are cut over early in July and the level then falls. The surface temp., fluctuating annually from 0.8°-24.6°C, follows that of the air closely. In summer thermal stratification occurs in the slow flowing reaches, with a temperature gradient in excess of 1°C per m. The transparency (Secchi disk of 35 cms.) varies from 1.2 to 2.7 m. The water is brown, varying from 15 to 40 Ohle units, the highest values are found in winter and spring, the lowest in autumn. Oxygen is very variable. In spring the water is saturated or supersaturated, in summer 75-80% saturated. Under ice there may be some deficiency. There is often supersaturation in weed beds and deficiency in zones of rushes and under dense *Lemna*. In the slow flowing reaches, stratification from 4-5 ml. O<sub>2</sub> per litre at the surface to 0-1 ml. O<sub>2</sub> per litre at the bottom is recorded. In backwaters this may be very marked, the surface in one case was 147% saturated, the bottom about 1 m. deep only 5% saturated. Pollution lowering oxygen content occurs. A convenient apparatus for collecting water samples, consisting of a large hypodermic syringe, without needle, lashed to the end of a pole and operated by a string, is described. The dissolved mineral content of the water is about 300-600 mg. per litre, varying seasonally. Ca<sup>++</sup> (58-112 mg. per litre) and HCO<sub>3</sub> (140-362 mg. per litre) are the most abundant ions. Passage of the water through the Tystrup-Bavelse Lakes reduces the concn. of the principal ions. The water contains a mean of 15 mg. NO<sub>3</sub> and 0.5 mg. PO<sub>4</sub> per litre above the lakes; the mean phosphate is reduced to 0.2 mg. below the lakes; the nitrate is unchanged. The pH varies from 7.1 to 7.8.—G. E. Hutchinson.

16479. Hrabě, S. Poznámky o zvířené ze studní a pramenu na Slovensku. [The fauna of springs and wells in Slovakia.] [In Czech with Ger. summ.] *Šborník Kluvo Přírodovědeckého (Brno)* 24: 23-30. 1 fig. 1941.—The fauna of wells and springs is recorded. *Nipharzargus rajecensis* from Schellenberg and *Pelosclex zaveti* are described. Other interesting spp. are *Trichodrilus latrensis*, *T. moraviensis* and *T. strandi*.—B. A. Kvěhala.

16480. Lindroth, Arne. (Aust. f. Binnenfisch. Drottningholm, Sweden.) Mikromethoden für die hydrobiologische Feldarbeit. Bestimmung des Sauerstoffes und des freien Kohlenoxydes. *Arch. Hydrobiol.* 38(3): 436-445. 6 fig. 1941.—Syringe pipettes may be used in determining the amt. of O<sub>2</sub> dissolved in samples of water. Winkler's reagents and HCl are added to 1.5 ml. of water by means of the automatic pipette. Titration of free I is carried out by a 1-2 ml. Rehberg burette. The Winkler method of determining the amt. of dissolved CO<sub>2</sub>, similarly done, is practicable.—Ingo Findenegg.

16481. Morton, Friedrich. Quellen in Hallstatt und ihre Pflanzengesellschaften. *Arch. Hydrobiol.* 38(1): 98-105.

1941.—Ten springs near Hallstatt (Austria) are descr. and their plant communities are given.—*Ingo Findenegg*.

16482. Planknin, Willi. Eine zweckmässige Aenderung des Czernys'schen pH-Kolorimeter. *Arch. Hydrobiol.* 38 (3): 459-461. 2 fig. 1941.—By using loose color-tubes instead of tubes fixed at small intervals before a white background, as is the case with the available Czernys colorimeter, reflection of the light by the adjacent tubes is eliminated and the color of the water sample will be interpolated more exactly.—*Ingo Findenegg*.

16483. Stangenberg, Marian. Die Produktionsbedingungen in den Teichen. III. Chemische Zusammensetzung des Oberflächenwassers der mit Superphosphat gedüngten und nicht gedüngten Karpfenteiche während der Zuchtseason. *Arch. Hydrobiol.* 38(4): 525-572. 16 fig. 1942.—Five carp ponds in Poland were studied: one of them had been manured with lime in autumn and superphosphate in spring; 2 ponds with superphosphate in spring; and 2 had not been manured. The water of ponds 1-3 contained large amts. of P compounds in the spring, decreasing gradually until May. During the chief period of production in summer, no differences of the amt. of P were found among the 5 ponds nor was any influence of the manure on the production observed. The development of algae in all carp ponds took place with an excess of P compounds in the water, medium amts. of carbonate and dissolved N-free organic substances and temporary deficiency of inorganic N-comp. Naumann's definition of eutrophy may be used for ponds also, if not only the amts. of N and P dissolved in the water are taken into account, but also the quantities of N and P that pass continuously from the bottom mud into the water and are soon assimilated. Relationship between potential productivity and real production is discussed.—*Ingo Findenegg*.

16484. Stundl, Karl. Limnologische Untersuchungen an einigen westfälischen Talsperren. *Arch. Hydrobiol.* 38 (1): 70-97. 9 fig. 1941.—Three impounded waters in the Sauerland (western Germany)—the Haspental-, Sorpetal- and Versetalsperre—were observed in the yrs. 1938-39 and chemical, bacteriological and plankton analyses were made. As the outlets of the dams are situated deep under the water surface or near the bottom, the hypolimnic body of water is not stagnant and therefore does not contain such large amts. of dissolved salts as may be the case in natural lakes with a superficial outflow. The age of the dams is of importance, older ones showing an increase of Cyanophyceae and other features of developing eutrophy. The number of bacteria in the impounded waters generally depends on the quantity of bacteria brought in by its inflows. Maxima occur in layers to which the affluents bring in their water. In deeper strata the number of bacteria is smaller, the living conditions being less favorable. Some maxima found in the surface layers probably are due to infiltration of bacteria from the air. *Escherichia coli* dies rapidly in stagnant water but other spp. also decrease in number, the diminution being most evident in summer. The decrease of bacteria in the dammed water may be produced by the intense sunshine, the facilitated sedimentation in warm water and the feeding activity of planktic animals. The plankton is not very rich in spp. and consists of the same forms as are found in natural lakes. The most important fish sp. is trout.—*Ingo Findenegg*.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also 16474, 16483, 16484, 17786, 17788, 17804, 18650, 18653, 18661, 18664, 18665)

16485. Adams, J. R. (Atlantic Biol. Sta., St. Andrews, N.B.) The oyster drill in Canada. *Fish. Res. Bd. Canada Progr. Repts.* 37. 14-18. 1947.—The oyster drill (*Urosalpinx cinerea*) is confined to a few isolated localities in Northumberland Strait and Minas Basin. In the latter area there are no oysters. At Malagash Basin in the former area, drills spawn from June 1 (water temp. 68°F) to Sept. The young drills emerge in 6 $\frac{1}{2}$ -8 wks., and are  $\frac{1}{8}$ - $\frac{3}{4}$  in. long by winter. The feeding season extends 18 weeks from a spring water temp. of 59°F to a fall temp. of 55°F. A drill can kill six 2-in. oysters or twelve 1-in. oysters in a season. Drills are still absent from the most important oyster producing regions of the Maritime Provinces. Handpicking of egg cases and drills at low tide is suggested as a means of control.—*D. G. Frey*.

16486. Alander, Harald. Investigations on the Baltic

herring. *Ann. Biol. [Copenhagen]* 1: 177-182. Map. 1943.—Swedish herring [*Clupea harengus*] investigations in 1939 to 1942 were less extensive in the Baltic than formerly. Age composition of drift gill-net and trawl catches shows the 1937 class strongly dominant in the southern Baltic, less so in the middle Baltic. In the Gulf of Bothnia the 1936 and 1937 classes share the dominance. Annual temp. and salinity curves for several stations suggest that low salinity in deeper layers together with high temp. at the surface, through their effects on plankton growth, may favor production of large year classes of herring.—*O. E. Sette*.

16487. Alikunhi, K. H., and V. Runganathan. (Govt. Fish., Madras, India.) Acclimatisation of *Cyprinus carpio* to the plains with notes on its development. *Current Sci.* 15(8): 233. 1946.—Young fish were transplanted successfully from the cool waters of high altitude to the very warm waters of ponds in the plains. The fish became adapted and grew rapidly.—*S. W. Brown*.

16488. Anderson, K. A. The stock of herring in the Skagerak, the Kattegat and the Sound in 1939. *Ann. Biol. [Copenhagen]* 1: 161-163. 1943.—The Swedish herring [*Clupea harengus*] fishery in the Skagerak and Kattegat is now mainly carried on by trawl which takes mainly 2- and 3-yr.-old herring. The drift net fishery in late yrs. has become poor due to lack of any yr.-class of sufficient strength to dominate through a series of yrs. In the Sound the 1939 catch was only  $\frac{1}{14}$  as large as that of 1916, when the 1913 class dominated through a series of yrs. The present apparent scarcity of herring, due to lack of good year-classes, is attended by higher growth rate with 3-yr.-old herring averaging 3 cm. longer than in 1916.—*O. E. Sette*.

16489. Aschehoug, Valborg, and R. Vesterhus. (Norwegian Canning Indust., Stavanger, Norway.) Investigation of the bacterial flora of fresh herring. *Zentralbl. Bakt. II. Abt.* 106(1/4): 5-27. 1943.—The normal bacterial flora of fresh winter herring, caught off the Norwegian coast, was investigated. Samples of fresh muscle were sterile. 272 isolations were made from the slime, gills and intestine, and classified according to Bergey's system. *Pseudomonas* and *Achromobacter* were the most important genera present on the surface of fresh fish, the genera *Flavobacterium*, *Micrococcus*, and *Proteus* being present in smaller numbers. *Flavobacterium* and *Proteus* could not be demonstrated in the intestine. *Proteus* occurs only incidentally. *Micrococcus* seems to be of little importance in fish spoilage. This is also true for the members of the genus *Pseudomonas* which were identified as *P. phosphorescens*. Spoilage of fish seems to be mainly due to 2 spp. of *Achromobacter*, viz. *A. liquefaciens* and *A. butyri*.—*J. E. Rombouts*.

16490. Bertram, G. C. L. Carp farming in Palestine. *Empire Jour. Exptl. Agric.* 14: 187-194. 1946.—Carp farming in Palestine was initiated by immigrants from central Europe. This paper describes carp culture, pond construction and supply of water, feeding, growth and yield of the fish, and the factors which assist or endanger this highly successful method of food production.—*C. E. Foister*.

16491. Blegvad, H. From the Danish Biological Station. *Ann. Biol. [Copenhagen]* 1: 175-176. 1943.—Summary tables are given for 1939 data on number of O-group and I-group plaice caught per 30-minute Johansen-trawl haul, mean anal-fin rays in O-group plaice, number of plaice [*Pleuronectes platessa*] of each age group caught per 5-hr. eel-tog haul and size-range, vertebrae count, stage of maturity, age distribution and average lengths of age groups of herring [*Clupea harengus*] in each of 3 localities in the Baltic area.—*O. E. Sette*.

16492. Bolomey, Rene A., and V. M. Sycheff. (Stanford U., Calif.) The determination of vitamin A in soupfin shark liver oils. *Div. Fish and Game California Fish Bull.* 64. 79-85. 1946.—Methylene chloride or xylene was partially substituted for chloroform in the Rosenthal-Erdelyi colorimetric detn. of vitamin A. The assay was greatly simplified as it was not necessary to remove either solvent prior to adding the  $\text{SbCl}_5$  reagent. Irrespective of extraction procedure the Rosenthal-Erdelyi reaction gave a standard deviation of  $\pm 3\%$ . Sterols and oxidation products in the unsaponifiable fraction were sources of error but were minimized by plotting absorption curves of the oils.—*W. E. Ripley*.

16493. Bolomey, Rene A., V. M. Sycheff, and Paul C. Tompkins. (Stanford U., Calif.) Determination of the per-

centage of oil in soupfin shark livers. *Div. Fish and Game California Fish Bull.* 64. 73-78. 1946.—Diethyl ether, methylene chloride and xylene were successfully used in short single extractions of oil from soupfin shark livers. It is concluded that although continuous extraction offers advantages in certain fields, use of the short single extraction method has much in its favor in routine analyses as many more analyses can be made per day with a given amount of equipment.—*W. E. Ripley.*

16494. Bolomey, Rene A., and P. C. Tompkins. (*Stanford U., Calif.*) The stability of vitamin A in whole shark liver and in the extracted oil. *Div. Fish and Game California Fish Bull.* 64. 87-93. 1946.—The vitamin A content in whole or ground soupfin livers was found to remain constant up to a month when stored at 20°C. As the distribution of oil and vitamin A was not uniform it was necessary to grind the livers and mix thoroughly to obtain a representative sample. The stability of the oils was measured as a function of the time required to decompose 50% of the vitamin under forced aeration at temps. between 70 to 100°C. The reaction had a temp. coeff. of about 2 for every 10°C. rise.—*W. E. Ripley.*

16495. Bryan, Paul, and Lawrence F. Miller. (Tennessee Valley Authority, Norris.) Spring fishing on several TVA mainstream reservoirs, 1945-1946. *Jour. Tennessee Acad. Sci.* 22(1): 70-78. 1947.—A spring fishing census was conducted on several T. V. A. mainstream reservoirs during 1945-1946 as part of a general inquiry to determine trends in the fish catch with special reference to year-round fishing. At the Guntersville Dam Tailwater-Wheeler Reservoir during 1945, information was obtained on 9,687 records. The Census-takers handled 54,456 fish, weighing 46,923 of them. The av. catch per trip was 5.4 fish weighing 2 pounds. The av. wt. per fish was 0.4 lb. both yrs. The total number of fishing trips based on daily counts by the T. V. A. Safety Service personnel was 18,017 trips representing a total catch of 98,385 fish weighing 37,142 pounds. In 1946, 7,198 records were obtained. All of the 60,756 fish enumerated were weighed. The av. catch per trip was 8.4 fish weighing 3.7 lb. The total number of fishing trips was 31,235 representing a catch of 266,374 fish having a total weight of 116,564 pounds. On the Chickamauga Reservoir-Wolftever Bridge 542 records were collected in 1945 and 1,170 in 1946. The catch averaged 1 fish per trip the 1st season and 1.4 the 2d season. On Wheeler Reservoir-Decatur Harbor Area 1,327 records were collected in 1945 and 982 were collected the following spring. Fishing was mostly for crappie. The catch averaged 2.3 fish per trip the first season and 3 per trip the next spring. On Pickwick Reservoir-State Line Camp 2,396 records were collected in 1945 and 1,793 were collected the following spring. The catch for the spring of 1945 averaged 5.2 fish compared with 3.4 fish the following spring. The creel census inquiries indicate that the catch by year-round fishing is not excessive.—*Paul Bryan.*

16496. Cabasso, V., et H. Roussel. Essai d'explication du phenomene dit "des eaux rouges" du lac de Tunis. *Arch. Inst. Pasteur Tunis* 31(3/4): 203-211. 1942.—In certain warm seasons the "Lac de Tunis" develops a disagreeable odor and many of the fish die. The authors demonstrated considerable numbers of *Vibrio desulfuricans* and conclude that the anaerobic conditions created by the evolution of large quantities of H<sub>2</sub>S were responsible for the deaths. A short time later the lake became red and examination showed many purple bacteria containing sulfur granules. The latter were grown in vitro in association with the *Vibrio*. The activity of the purple bacteria in oxidizing the sulfide to sulfate is an important factor in rendering the water aerobic and permitting survival of fish life. Apparently the photosynthetic activity of the purple bacteria was not realized.—*R. E. Hungate.*

16497. Clark, Frances N. (*State Fish. Lab., Terminal Island, Calif.*) Analysis of populations of the Pacific sardine on the basis of vertebral counts. *Div. Fish and Game California Fish Bull.* 65. 1-26. 3 fig. 1947.—Vertebral counts made on 24,981 adults, 9,240 one group and 16,617 zero group sardines indicate that fish from British Columbia to Pt. San Eugenio in central Lower California comprise a mixture of populations the young of which may have been reared on nursery grounds in any of these localities. Interchange between nursery grounds begins early perhaps before the fish

are a year old. The nursery grounds off California and northern Lower California presumably make the greatest contributions to the population. Sardines south of Pt. San Eugenio and in the Gulf of California with a vertebral average of 51.2 rarely mix with the northern population with a vertebral average of 51.7. Certain year-classes in all localities are characterized by high or low vertebral averages.—*F. N. Clark.*

16498. Coe, Wesley R. (*Yale U., New Haven, Conn.*) Nutrition, growth and sexuality of the Pismo clam (*Tivela stultorum*). *Jour. Exptl. Zool.* 104(1): 1-24. 1947.—The Pismo clam is a typical scavenger, ingesting only minute organisms and cells, together with both organic and inorganic particles. Digestion is mainly intracellular and is accomplished principally by the phagocytic cells of the digestive diverticula, aided by migratory phagocytes in the lumen of the alimentary canal. The principal extracellular enzymes in the canal are amylase and glycogenase incorporated in the style. The style also supplies a weak cellulase which is evidently inadequate for the digestion of dinoflagellates and other phytoplankton with cellulose walls, for most of these cells pass through the body without apparent change, some of them in viable condition. Diatoms, bacteria, flagellates and other minute protozoa, gametes of algae and invertebrates, as well as detritus from the disintegration of the cells of all marine plants and animals are the principal sources of nutrition. The detritus may originate locally or it may be brought from a distance by ocean currents. Marked individuals living under natural conditions, as well as the entire population, increased their average lengths approx. 21 mm. a year for their first 3 years of life and at a somewhat lower rate thereafter. The rates show a general correlation with the temp. and with the food supply. The species is unisexual, with < 1% developmental ambisexuality.—*Aulh. (courtesy Wistar Bibl. Serv.).*

16499. Crandall, Julie V. The story of Pacific salmon. 59p. 16 pl. Binfords and Mort. Publishers: Portland, Oregon, 1946. Pr. \$1.50.—A popular account of the Pacific salmon.—*F. Fry.*

16500. Devold, Finn. Plaice investigations in Norwegian waters. *Fiskeridirektoratets Skrifter Serie Havundersøkelser (Rept. Norwegian Fish. and Marine Invest.)* 7(3): 1-83. 5 maps, 4 pl., 1 fig. 1942.—The plaice, *Pleuronectes pilatessa*, has long been a commercial fish in Norway. Only in this century has it become important. The cause is the development of fresh fish export, and the introduction of the Danish seine in 1899. This gear was so effective that export of plaice rose from 78 tons in 1922 to 4699 tons in 1932, then fell to 2750 tons in 1936. Regulative restrictions were introduced. They included a closed season and a size limit. Investigation of the biology of the plaice is on a broad basis to learn what quantity may rationally be caught. Some results are given. Marking expts. suggest that plaice on the coast banks are mobile, whereas those on the fjords are more stationary. The reason is probably the topographical features of the bottom. The gradual change in number of vertebrae in plaice along the outer Norwegian coast does not justify a division into several populations. Statistically there is a real difference in the number of vertebrae between the population in Trondheim fjord and the plaice along the coast outside. Segregation is going on in the plaice stock because the individuals which grow fastest seek deeper water at an earlier age than those which grow more slowly. The winter rings of the interoperculum may be useful for computing the total length of plaice in different yrs. of life. Otoliths reveal the age at the onset of maturity. The age-composition and relative increase or decrease of mature spawning stock have been computed one year in advance and show good argument with observed compositions.—*J. S. Dendy.*

16501. Dyk, Václav. (*Inst. Allg. Biol. Tierärztl. Hochschule Brno, Czechoslovakia.*) Über die natürliche Nahrung der Bachforelle in verschiedenen Gewässern. *Arch. Hydrobiol.* 36(1): 118-125. 10 fig. 1939.—About 600 specimens of *Trutta fario* from various localities in Moravia (tributaries of the Danube and the Elbe) and of different age were examined as to their gastro-intestinal contents. In the most rapid reaches of mountain streams, the favored food of trout are the larvae of Diptera (Chironomidae, *Simulium* and *Liponeuria*). These were found in the intestines of 75% of the specimens caught in that habitat. Less frequent were



larvae of Caddis flies (65%), Coleoptera which had fallen into the water (50%), larvae of Ephemeroptera and of Plecoptera and imagines of Formicidae. In less rapid streams and small rivers 78% of the fishes contained larvae of Trichoptera, 31% larvae and imagines of Diptera and 23% Coleoptera. Fishes (*Phoxinus phoxinus* and *Cottus poecilopus*) are also taken as food. In the least rapid Highland streams and rivers 50% of trout had fed on larvae of Caddis flies. In spring, larger animals play an important role. Earthworms, larvae of *Molge* and *Rana*, *Potamobius astacus* and young specimens of *Arvicola amphibius* may be found among the gut contents. In summer, preference is given to the "air-food" (42%) esp. to Coleoptera, Formicidae and Homoptera.—*I. Findenegg.*

16502. Dyk, V. (Vet. Sch., Brno, Czechoslovakia.) Vzdornost raka říčního-Potamobius astacus L.-k znečištění vody umělými hnojivými, mocí skotu a vepřu a hašeným vápnem. [The resistance of the freshwater lobster to the pollution of waters by artificial fertilizers, urine of cattle and pigs, and by slaked lime.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 15: 84-86. 1940.—The normal artificial manuring of fields has no unfavorable effect on the freshwater lobster. A slight pollution of water by urine is also harmless, but careless use of slaked lime and its penetration to the water is harmful to the freshwater lobster population.—*E. Jermoljev.*

16503. Dyk, V. (Hydrobiol. Res. Sta., Vodňany, Czechoslovakia.) Snášeni prudkých vykyvu chemismu vody a léčení ryb pokusně poškozených pobytem v kyselé vodě. [The resistance of fish to the chem. composition of water and the treatment of fish experimentally affected in acid water.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 15: 378-381. 1 fig. 1940.—In the expts. in which pH decreased to 3.6, all fish died except the tench. All fish affected by acid water recovered in water mixed with finely grounded limestone. The spring acid and soft water from peat meadows and forests can be harmful to the fish.—*E. Jermoljev.*

16504. Dyk, V. Lihnutí pstružích jiker na hlíněných taškách. [The incubation of trout spawn on clay tiles.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 16: 175-179. 1941.—Hein's method of incubating trout spawn between clay tiles, as improved by Wordhaus, is satisfactory when there is insufficient space or when a great quantity of spawn has been used.—*E. Jermoljev.*

16505. Dyk, V. K otázce vhodných příkrmu pro raky. [Suitable additions to the fresh water lobster's food.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 16: 316-318. 1941.—Expts. showed that lupine is a good plant food and mashed fresh fish meat a good animal food.—*E. Jermoljev.*

16506. Dyk, V. Hranice škodlivosti hydroxidu vápenatého pro kaprovité ryby. [The limit of harmfulness of calcium hydroxide for the carp.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 18: 218-221. 1943.—Pollution of water by 0.01% calcium hydroxide is harmful to the fish and 0.02% is fatal.—*E. Jermoljev.*

16507. Dyk, V. Jedovatost saponinu obsažených v kaštaněch pro některé druhy našich ryb. [The toxicity of saponins from horse chestnut seed for certain vars. of fish in Czechoslovakia.] [In Czech with Ger. summ.] Sbor. Česke Akad. Zem. 18: 221-223. 1943.—A small quantity of horse chestnut, especially if macerated in water, may kill fish. This effect is more pronounced in standing waters.—*E. Jermoljev.*

16508. Eschmeyer, R. W., D. E. Manges, and O. F. Haslbauer. (Tennessee Valley Authority, Norris.) Trends in fishing on TVA storage waters. Jour. Tennessee Acad. Sci. 22(1): 45-56. 1947.—This is the fourth of a series of papers on the fish catch in TVA storage reservoirs. For purposes of comparison, the 1946 study was almost identical with the one made in 1945. Fishing was more intensive in 1946 than in 1945. On Norris Reservoir the number of spring fishing trips rose from 72,300 in 1945 to 86,000 in 1946. Census records for Cherokee, Douglas, and Hiwassee Reservoirs suggest that fishing has also increased on these waters. The tendency has been for crappie (*Pomoxis nigro-maculatus* and *P. annularis*) to occupy an increasing predominance in the fish population. In 1946, however, on Norris walleye (*Stizostedion v. vitreum*) increased with a corresponding decrease in crappie and bass. Data suggest that the apparent increase in the walleye population is real. Fishing for walleye was better in 1946 than in any previous year. Analysis of the 1946 spring fishing on 4 storage reservoirs is presented. On Norris the catch con-

sisted of 21% black bass (*Huro salmoides*, *Micropterus dolomieu*, and *M. punctatus*), 65% crappie (*P. nigro-maculatus*), 8% walleye, 4% sauger (*S. c. canadense*), and 2% bluegill (*Lepomis macrochirus*). In June, walleye represented 16% of the catch in numbers, and almost 1/3 of the catch by wt. On Cherokee fishing was better than in 1945 despite a great increase in fishing intensity. On Douglas the 1946 catch was greater than the 1945 number per trip, but lower in pounds per trip. A decided decline in fishing on Hiwassee is attributed to poor balance of fish populations and cannot be a result of the removal of the closed season.—*J. S. Dendy.*

16509. Galtsoff, Paul S., and Walter A. Chipman, Jr. (U. S. Fish and Wildlife Serv., Washington, D. C.) Oxygen consumption of *Ostrea virginica*. Anat. Rec. 96(4): 25-26. 1946.—An abstract.

16510. Godoi, Manuel Pereira de. A piracema de 1944-45 no Rio Mogi Guassú, Cachoeira de Emas. [The runs of fish in 1944-45 at the Ema Falls of the Mogi Guassú River.] Bol. Min. Agric. 34(3): 103-109. 3 fig. 1945.—An expt. station is located at the falls to study the relations of breeding runs and river levels. The river was low in 1944 when the fish ascended in full breeding condition. Heavy rains caused a rapid rise on Nov. 15 and the fish began to spawn at once. Because the fish *Prochilodus hartii* will not ovulate in quiet water (tanks), extracts of the hypophysis were used to cause ovulation. The young developed normally.—*D. E. Davis.*

16511. Greeley, John R. (New York State Conserv. Dept., Albany.) Half a thousand miles of public trout stream. Trans. North Amer. Wildlife Conf. 10: 326-331. 1945.—New York's program of acquiring public fishing rights on trout streams began in 1935; these acquisitions now total 575 miles on 33 streams. The system used features permanent easements, not purchase of lands, thus avoiding interference with use of the streams by landowners. In addition to immediate benefits accruing to the public by having the permanent rights to fish on these areas, such acquisitions facilitate improved management. To cope with erosion damage, a large amt. of bank improvement has already been done on these streams, to the benefit of both trout resources and landowners. There is a need for intensive management to make these public fishing streams function to best advantage. Field studies are required to plan the type of individualized management needed, including stream improvement structures, stocking and control of fish population conditions.—*J. R. Greeley.*

16512. Gunter, Gordon, F. G. Walton Smith, and Robert H. Williams. (U. Miami, Coral Gables Fla.) Mass mortality of marine animals on the lower west coast of Florida, November 1946-January 1947. Science 105(2723): 256-257. 1947.—Catastrophic death involving millions of fish occurred between Nov. 1946 and Jan. 1947 on the south Florida Gulf Coast. Many other spp. of marine organisms were also killed. All kinds of fish succumbed. The mass death was associated with the presence of streaks of discolored water. Analysis of the water showed it to be unusually rich in copepods and invertebrate larvae; there were large quantities of diatoms with *Coscinodiscus* sp. as the dominant organism, and smaller numbers of naked flagellates, particularly *Gymnodinium*. The water contained no unusual salinities. Its temps. ranged from 22.5° to 26°C, with a pH close to 8.2, a low O<sub>2</sub> content, and variable reports of the presence of H<sub>2</sub>S. An odorless but acrid gas was detected by boiling samples of water.—*H. M. Kaplan.*

16513. Haslbauer, Otto F., and Daniel E. Manges. (Tennessee Valley Authority, Norris.) Sauger movement in Norris Reservoir, Tennessee. Jour. Tennessee Acad. Sci. 22(1): 57-61. 1 fig. 1947.—During 4 two-week netting periods (Dec. 3-Mar. 8) on lower Norris Reservoir, 342 sauger (adults) (*Stizostedion c. canadense*) were jaw-tagged and released in the same localities where they were caught. The nets recaptured 45 of these fish. About equal numbers of fish netted in each of 4 localities suggest even distr. in that vicinity. These fish moved extensively during the period of netting, but there was no evidence to suggest that the movement followed a set pattern. 14 tagged fish were recaptured later by anglers, suggesting that only a small % of the sauger crop is being harvested. The fish recaptured by anglers had moved an average of 20 miles (minimum distance) in an av.

93 days. It is believed that the extensive spring movement is associated with spawning.—J. S. Dendy.

16514. Huntsman, A. G. (U. Toronto, Canada.) Are lake salmon hereditarily distinct? *Science* 105(2724): 289-290. 1947.—Peculiar salmon in certain lakes of Europe and eastern N. America have been considered to be distinct spp., subspp., or vars. of the ordinary sea salmon. Similar, supposedly non-migratory kinds have been found in various other spp. of Salmonidae. These should not be accepted without question as being hereditarily distinct kinds rather than the effects of environment on the individual. An expt. confirming this statement is descr.—H. M. Kaplan.

16515. Järvi, T. H. Die Bestände der kleinen Maränen (*Coregonus albula* L.) und ihre Schwankungen. I. Pyhäjärvi (Südkaarelen.) *Acta Zool. Fennica* 32: 1-89. Map, 13 pl., 2 fig. 1942.—The relative abundance of 32 year-classes (1907-1938) was studied. A periodicity caused by unsuitable climatic conditions during hatching and by human intervention led to altered food conditions resulting in different sizes and growth rates of respective year-classes.—W. Rosén.

16516. Järvi, T. H. Die Bestände der kleinen Maränen (*Coregonus albula* L.) und ihre Schwankungen. II. Ober- und Mittel-Keitele. *Acta Zool. Fennica* 33: 1-145. 3 maps, 12 pl., 5 fig. 1942.—The year-classes 1907, 1908 and 1911-1941 were studied. A periodicity of the relative abundance of the year-classes was found to be due to the climatic conditions during hatching out.—W. Rosén.

16517. Klocke, Jessie Finley, Peter I. Tack, Margaret A. Ohlson, Ruth Nitchals, Edna Lefler, and Norma Scott Henry. (Michigan State Coll., East Lansing.) The nutritive value of fish from Michigan waters. II. Thiamin of lake herring, carp, common sucker, burbot and smelt. *Food Res.* 12(1): 36-43. 1947.—The effect of freezing, refrigeration, holding, baking, frying and possible seasonal and environmental conditions on the thiamin content of lake herring (*Leucichthys artedii*), common suckers (*Catostomus c. commersonii*), carp (*Cyprinus carpio*), burbot (*Lota lota maculosa*) and smelt (*Osmerus modax*) have been studied. The fish were analyzed by the thiochrome method after digestion with the enzyme Polidase-S. Lake herring caught in May and June averaged 0.89  $\gamma$  of thiamin per gram of fresh tissue. During the fall spawning season the average was 0.58  $\gamma$  per g. and in Jan. and Feb., the average was 1.12  $\gamma$  per g. The herring from Green Bay averaged 0.86  $\gamma$  per g. of thiamin and from Saginaw Bay 0.87  $\gamma$  per g. Burbot averaged 3.78  $\gamma$  of thiamin per g. of fresh tissue. No thiamin was found in the carp, smelt and common suckers analyzed. Thiamin destruction by an enzyme found in some raw fish tissue has been reported. Herring frozen, then stored, lost an insignificant amt. of thiamin in 11 months. Burbot appeared to increase in thiamin due to a decrease in moisture. Refrigeration at 4°C for 48, 120, and 137 hrs. resulted in some loss in 2 groups of herring. Baking resulted in an insignificant loss of thiamin in herring and there was 88-84% retention during frying. Lake herring may be considered a good source and burbot an excellent source of thiamin.—M. A. Ohlson.

16518. Kostomarov, B. (Animal Breed. and Gen. Res. Inst., Brno, Czechoslovakia.) Vztahy mezi délkou střeva a velikostí a vahou kapra. [The relationship between the length of intestinal tract and the wt. and size in carp.] [In Czech with Ger. summ.] *Sbor. Česke Akad. Zem.* 15: 132-137. 5 fig. 1940.—418 carp were investigated. The relationship between the length of intestinal tract and the length of carp between 50 and 550 mm. is linear. Carp between 50 and 90 mm. long have an intestinal tract longer than the body; between 90 and 230 mm. the intestinal tract is twice as long as the body, between 230-500 mm. the intestinal tract is > twice the length of the body. The relationship between the length of intestinal tract and body wt. of carp between 50 and 3,350 g., expressed graphically, is a curve. Up to 600-700 g. the length of intestinal tract in mm. is greater than the wt. Carp weighing between 1800 and 2000 g. have an intestinal tract in mm. which is  $\frac{1}{2}$  of the amt. of g.—B. A. Kvicala.

16519. Kotthaus, Adolf. Grössenzusammensetzung der deutschen Kabeljau- und Schellfischanlandungen aus dem nordatlantischen Schelfgebiet während der Fangperiode 1938-1939. *Ann. Biol. [Copenhagen]* 1: 17-18. 1943.—Length-frequency curves of cod [*Gadus morhua*] and haddock [*G. aeglefinus*] for 1938-39 are given by 4 fishing regions

separately and for the entire fishery in continuation of Lundbeck's series of 1929 to 1939.—O. E. Sette.

16520. Kříženecký, Jaroslav. (Sekt. Zuchtbiol. Land. Forsch. Anst., Brünn, Czechoslovakia.) Zur Frage des Geschlechtsverhältnisses beim Flussbarsch (*Perca fluviatilis* L.). *Arch. Hydrobiol.* 37(3): 466-470. 1940.—Some 3501 specimens of perch, most of them only one summer old, from 3 fish ponds in Bohemia were examined as to sex. 1948 were  $\sigma^7 \sigma$  and 1553  $\varnothing \varnothing$  (viz., 121.14:100). If the opinion of some authors is confirmed, that in certain populations the number of  $\varnothing \varnothing$  greatly exceeds that of  $\sigma^7 \sigma$  (up to 10:1), the only possible explanation would be high mortality of  $\sigma^7 \sigma$  in later yrs. In giving sex ratios it is necessary, therefore, to refer to distinct age classes.—I. Findeneegg.

16521. Lawrence, J. M. (Agric. Expt. Sta., Auburn, Ala.) Stocking your fish pond. *Alabama Conserv.* 18(6): 5-12. 1946.—Recommends 2 combinations of fish spp. for use in farm ponds: bluegill bream, largemouth bass, and *Gambusia* minnows; and bluegill bream, largemouth bass, and white crappie. Numbers of each species are recommended for stocking in fertilized ponds and unfertilized ponds.—F. C. Edminster.

16522. Logie, R. R. Green-gilled oysters are wholesome. *Canada Fish. Res. Bd. Atlantic Biol. Sta. Circ.—Gen. Ser.* 6. [1.] 1 fig. 1947.

16523. Loosanoff, Victor L. Survival and mortality of frozen oysters (*O. virginica*). *Anat. Rec.* 96(4): 90. 1946.—An abstract.

16524. Loosanoff, V. L., and J. B. Engle. (U. S. Fish and Wildlife Serv. Marine Lab., Milford, Conn.) Feeding of oysters in relation to density of microorganisms. *Science* 105(2723): 260-261. 1947.—The effect of diff. concs. of microorganisms upon the rate of water pumping and, therefore, feeding of oysters, is descr. There are rather definite concs. above which the density of the organisms interferes with the feeding of oysters. These concs. corresp. to about 2,000,000 *Chlorella*, 70,000 *Nitzschia*, and 3,000 *Euglena*/ml. of water. Above these concs. little or no food is swallowed, and the oysters become sluggish. The microorganisms accumulate in the gills and mantle chamber and adaptations to get rid of them are set up. The amts. of pseudofeces formed are roughly proportionate to the amts. of plankton present, and large amts. of pseudofeces are an index of unfavorable conditions. Oysters seem to feed most efficiently when the water contains small quantities of suspended matter.—H. M. Kaplan.

16525. Loosanoff, Victor L., and Charles A. Nomejko. On growth of oysters during hibernation. *Anat. Rec.* 96(4): 68. 1946.—An abstract.

16526. McKenzie, R. A. The prairie "jigger" for setting gill nets under ice. *Canada Fish. Res. Bd. Atlantic Biol. Sta. Circ.—Gen. Ser.* 7. [1-2.] 1947.

16527. Mazzarelli, Giuseppe. Altra grande pesca di *Amnodytes cicerellus* Raf. allo stato giovanile nello stretto di Messina e adiacenze tirreniche. [Another big fishery of young *A. cicerellus* in the Strait of Messina and neighbourhood.] *Boll. Zool. Agrar. e Bachicoltura. [Turin]* 14(1/3): 91-92. 1943.—In the yr. 1941, 26,577 quintals of *A. cicerellus* were taken in 4 months' time. A similar invasion of the same sp. occurred in the same area in 1935.—I. L. Coifmann.

16528. Miller, Lawrence F., and Paul Bryan. (Tennessee Valley Authority, Norris.) The harvesting of crappie and white bass in Wheeler Reservoir, Alabama. *Jour. Tennessee Acad. Sci.* 22(1): 62-69. 1 fig. 1947.—Data on the harvesting of crappie and white bass were obtained through a tagging program on Wheeler Reservoir, Alabama, during 1945-46. Out of 1,000 crappie tagged during the spring of 1946, 11 were recaptured by anglers. Of 898 white bass tagged during the summer of 1945, 1 was recaptured and of 151 tagged during the spring of 1946, 3 were recaptured. The harvesting of 1.1% of the tagged crappie in 1946, of < 1% of the white bass in 1945, and of 2% of the white bass in 1946 suggests that most of the white crappie and white bass are not harvested.—L. F. Miller.

16529. Miller, Robert R. (U. S. Nation. Mus., Washington, D. C.) The need for ichthyological surveys of the major rivers of western North America. *Science* 104(2710): 517-519. 1946.—The need for ichthyological surveys of the rivers of western N. America is urgent because of changes

caused by: (1) the effects of dams and diversions, water-power development, water storage, and irrigation practices; (2) pollution from mining operations; (3) destruction of vegetation by livestock resulting in increased floods and erosion (particularly serious in the Southwest); and (4) introduction of exotic spp.—*H. M. Kaplan*.

16530. Molander, Arvid R. Sprat and milieu-conditions. *Ann. Biol. [Copenhagen]* 1: 164-174. Map, 2 fig. 1943.—According to age composition in samples taken from sea catches during 1933 to 1939, the stock of sprat [*Clupea sprattus*] on the Swedish west coast is made chiefly of 1- and 2-yr.-old fish and according to catch records in the Uddwalla fjords during the same years fluctuations in yr.-class strength are immediately reflected in the catch. Correspondence between the incidence of windy weather during the spawning season and the occurrence of poor year-classes is demonstrated and attributed to direct mechanical destruction of eggs by rough seas with temp. modifying the duration of the incubation period and hence exposure to wind-damage. There is an inverse relation between growth and the strength of the year-class which was strongly negated in one instance when the abnormally cold winter of 1940 caused much slower growth than would be expected in a weak year-class.—*O. E. Sette*.

16531. Montagnes, James. Canada's growing fish industry. *Food Indust.* 18(11): 1718-1720, 1836-1838. 1946.—Canada's fishing industry has grown to \$100,000,000 in 1945. Sixty varieties of food fishes are caught especially salmon, herring, cod, lobster, whitefish, halibut, sardines, haddock, pilchard and pickerel.—*R. S. Harris*.

16532. Némec, A., a J. Fastrová. (Agric. Res. Inst., Praha, Czechoslovakia.) Studie o obsahu živin v rybníčních vodách velkostatku Chlumec nad Cidlinou ve srovnání s přirozeným přírůstkem ryb. [Studies on nutrient content of fish ponds of Chlumec and its relation to growth increase of fish.] [In Czech with Ger. summ.] *Sbor. Česke Akad. Zem.* 15: 126-132. 1940.—The growth increase of fish in these ponds depends upon the conc. of phosphoric acid and K. The latter is of greater importance.—*B. A. Květal*.

16533. Odlaug, Theron O. (State Teachers Coll., Duluth, Minn.) The effect of the copepod, *Mytilicola orientalis*, upon the Olympia oyster, *Ostrea lurida*. *Trans. Amer. Microsc. Soc.* 65(4): 311-317. 1946.—The red copepod, *M. orientalis*, is widespread in lower Puget Sound, occurring in the intestinal tract of the Olympia oyster, *O. lurida*, as well as in the Pacific oyster (*O. gigas*), clams (*Paphia staminea*), mussels (*Mytilus edulis*), and the eastern cup (*Crepidula fornicata*). Using the volumetric method of analysis, "condition factors" of the Olympia oyster were obtained and an attempt was made to correlate the presence or absence of *Mytilicola* with the condition factors. While it appeared that oysters infected with *Mytilicola* had a lower condition factor than those which were uninfected, loss of spawn from the body of the oyster was of as much or greater importance in reducing the condition factor.—*T. O. Odlaug*.

16534. Ripley, Wm. Ellis. (Stanford U., Calif.) The soupfin shark and the fishery. *State Div. Fish and Game California Fish Bull.* 64. 6-37. Map, 1 fig. 1946.—The Calif. soupfin (*Galeorhinus zyopterus*) fishery expanded tremendously in 1938 and reached a peak in landings in 1939 due to the discovery of very high potency vitamin A oil in the liver. Prices varied from \$1.50 to \$13 per pound of liver. Catch per unit of effort data indicated serious decline, decreasing in Eureka from 55.4 sharks per unit in 1942 to 7.7 in 1945. All other areas indicated similar trends. The fishery, shown to be seasonal, occurs in no. Calif. during fall and winter and in so. Calif. during spring and summer. Sex ratios in the catch indicated differential sex migrations. Eureka-Fort Bragg produced 97.5% males, Central Calif. 57.7, Santa Barbara 51.6, and San Pedro 2.2%. In Santa Barbara, ♀♀ were found in <30 and ♂♂ in >40 fathoms of water. Breeding takes place by May and is indicated to occur each yr. Nursery areas were found on Ventura flats and in San Francisco, Monterey and Tomales Bays. The wt. of ♂ soupfin increased at the 3.2 power of the length, immature ♀♀ at 3.3, and mature ♀♀ at 4.2. The % of liver wt. to body wt. ranged from 2 to >20% in ♀♀, the percentage decreasing as gestation progressed. Females contained 6-54 embryos and averaged 35. Sardines were an important item in the diet.—*W. E. Ripley*.

16535. Ripley, Wm. Ellis, and Rene A. Bolomey. (Stan-

jord U., Calif.) The relation of the biology of the soupfin shark to the liver yield of vitamin A. *Div. Fish and Game California Fish Bull.* 64. 39-72. 1946.—Whole soupfin livers were ground and a sample transferred to pint cartons and frozen in dry ice [solid CO<sub>2</sub>] in the field. Colorimetric reaction for vitamin A was used for analyses in the laboratory. Female soupfin data were divided into 5 stages of sexual condition: Stage A without eggs, B with unfertilized eggs, C with fertilized eggs, D with pups and E spent. Percentage of oil and vitamin A in I. U./gm. oil, I. U./lb. liver and total I. U. in liver increased with increase in length and wt. of the shark in both ♂ and ♀. ABC ♀♀ had a higher percentage of oil (75) in livers than did adult ♂♂ (60). DE ♀♀ averaged <40%. Male livers averaged 3 times more potent vitamin A oils than ♀♀. DE ♀♀ averaged 190,000 to 260,000 I. U./gm. liver oil which was much higher than that of ABC ♀♀ and indicated that pregnant ♀♀ used up their liver oil reserves as gestation progressed. Adult ♂♂ and DE ♀♀ had about 2½ times more A/lb. liver than ABC ♀♀, demonstrating that the vitamin A was concentrated in DE livers as oil reserves were withdrawn during pregnancy. Males and ABC ♀♀ had about the same total A content with DE ♀♀ containing somewhat less than either of these. 717 million I. U., the greatest amt. in any one soupfin, was found in a 171 cu. ♂. There was no indication that seasonal or geographic distribution was an important factor in vitamin A production.—*W. E. Ripley*.

16536. Saviano, M. (U. Naples, Italy.) Ricerche sul contenuto in vitamina A di pesci Mediterranei. I. *Anguilla vulgaris*. [Studies of the vitamin A content of Mediterranean fishes. I. *A. vulgaris*.] *Pubbl. Staz. Zool. Napoli* 19(2): 103-110. 1942.—The colorimetric method of Carr and Price (1926), with the correction for carotenoids suggested by With (1941), was employed to determine the vitamin A content of various tissues (exclusive of head and skeleton) of young eels (*A. vulgaris*) from fresh water in the vicinity of Naples. The method is described in detail in the text. The conc. of vit. A per 100 g. of tissue ranged from 300,000 to 1,000,000 or more I. U. for the liver, and was approx. 7,000 I. U. for skin, muscle, and non-hepatic viscera. The tissues (exclusive of head and skeleton) of an eel weighing 60 g. contained >7,000 I. U., of which approx. 3,000 I. U. were found in the liver. Control detns. obtained by bioassay methods supported the above findings. The author believes that these data establish the value of the eel as a convenient and economical source of vitamin A in the diet.—*J. A. Mathewson*.

16537. Schmidt, U. Der Schollenbestand der Deutschen Bucht. *Ann. Biol. [Copenhagen]* 1: 138-139. 1943.—According to age-composition, in terms of average catch per hour of research steamers, the plaice [*Pleuronectes platessa*] stock in 1937, 1938, and 1939 declined materially below 1930 and 1933 when the strongly dominant 1928 class constituted a major portion of the catch. The decline is attributed to lack of good year-classes, to intensified fishing by the German fleet, and to the intensified flatfish fishery of the Dutch and Belgian fleets taking undersized plaice. The average lengths of fish of corresponding age-groups varied inversely with population density. Relative strength year-classes 1922 to 1937 are tabulated, and also the % of individuals over 23 cm. in length for years 1930, 1933, and 1939.—*O. E. Sette*.

16538. Schmidt, U. Alterszusammensetzung der Seezungenbevölkerung in der Deutschen Bucht. *Ann. Biol. [Copenhagen]* 1: 142-144. 1943.—Relative age-composition and average lengths of individuals of each age group, given for May to June and for Sept. to Oct. for the years 1934-39, in catches by research ships, do not indicate differences beyond those expected from small sample variation.—*O. E. Sette*.

16539. Scordia, Concettina. Prime indagini sul valore quantitativo delle concentrazioni gamiche del tonno (*Thunnus thynnus* [L]). [First researches on the quantitative value of the gamic concentrations in the tunny.] *Boll. Zool. Agrar. e Bachicoli.* [Turin] 14(1/3): 93-103. 1943.—Genetic groups of tunnies have been observed in the Strait of Messina for 10 yrs. The concs. were formed by specimens <9-10 yrs. old.—*I. L. Coifmann*.

16540. Scordia, Concettina. Ancora sulle fluttuazioni del prodotto della pesca del pesce spada (*Xiphias gladius* L.) nello Stretto di Messina e adiacenze tirreniche. [Fluctuations in the fishery of *X. gladius* in the Strait of Messina and



neighborhood.] *Boll. Zool. Agrar. e Bachicolt.* [Turin] 14(1/3): 115-123. 5 fig. 1943.—Since 1929 the fishery of *X. gladius* has undergone a periodic fluctuation consisting in one year of increase and 2 subsequent yrs. of decrease. The production has generally increased in recent yrs.—*I. L. Coifmann.*

16541. Smith, M. W. Improve trout angling by poisoning coarse fish. *Canada Fish. Res. Bd. Atlantic Biol. Sta. Circ.—Gen. Ser.* 8. [1-2.] 1947.

16542. Soalheiro, Marcelino. Determinação do período de reprodução da sardinha verdadeira. [Determination of the breeding season of the true sardine.] *Bol. Min. Agric.* [Rio de Janeiro] 34(6): 1-13. 11 fig. 1945.—The true sardine (*Sardinella aurita*) belongs to the family Clupeidae of the order Isopondyli. The characters of the family, genus and species are presented in detail and a key for determination of the genera is included. This sp. is found in the tropical seas throughout the world and in Brazil it is found principally in the waters near Rio de Janeiro. To determine the breeding season near Rio de Janeiro, 2311 specimens were collected of which 47% were ♂♂. From March to Oct. the gonads are regressed. The maturation of the gonads occurs in the latter half of Oct. Ovulation begins in Nov. and ends in Jan. Specimens measuring 190-210 mm. had the largest gonads. An average of 94 ova were ovulated.—*D. E. Davis.*

16543. Stejskal, A. *Scatophagus argus*. *Umwelt* 1(1): 20-21. 2 fig. 1946.—This brackish-water fish from the Southern Seas can be kept in fresh water aquaria, but only when young, and always perishes before attaining sexual maturity.—*Max Onno.*

16544. Stroud, Richard H. (Tennessee Valley Authority, Norris.) The status of yellow bass in TVA waters. *Jour. Tennessee Acad. Sci.* 22(1): 79-86. 1947.—A sample of 160 yellow bass (*Morone interrupta*) caught in TVA main-stream reservoirs during 1944 and 1945 was studied to determine the present status of the sp. in these waters. The av. growth-rate, similar for both sexes and apparently slow, was as follows: At age I, T.L. = 3.1 in.; at age II, T.L. = 5.7 in.; at age III, T.L. = 7.1 in.; at age IV, T.L. = 8 in.; at age V, T.L. = 8.5 in. Two ♀♀, much larger than any other individuals caught, were 10.3 in. and 11.4 in. (total length). Few yellow bass appear to live longer than 6 years in TVA waters—a somewhat extended life-span, by comparison with a much faster growing population of yellow bass in the same latitude (Reelfoot Lake), and is probably to be associated with the much slower growth of the former. "Condition factor," *K*, was computed as  $2.49 \pm 0.028$  for the sample. Yellow bass form <5% of the fisherman-catch and are even fewer in the standing population. White bass (*Lepibema chrysops*), by comparison, are many times more abundant and grow very much faster. Yellow bass are of little importance in TVA waters.—*R. H. Stroud.*

16545. Tack, Erick. (Fisch. Inst., U. Königsberg, Germany.) Die Ellritze (*Phoxinus laevis* Ag.), eine monographische Bearbeitung. *Arch. Hydrobiol.* 37(3): 321-425. 18 fig. 1940.—Minnows taken from 12 localities in western Germany were studied. Age was detd. by means of the scales. The sp. is short-lived, the oldest specimen being only 6 yrs. old. At the age of 1 and 2 years, ♂♂ and ♀♀ were equally frequent, but in the 4 and 5 year classes <1/3 were ♂♂. The morphology, proportions of the body and color of the specimen were not very variable. The fore-fin of adult ♂♂ is broader and more rounded, so that the sexes may easily be distinguished. Examinations of the gut contents showed that the larvae feed chiefly upon Rotatoria, Chironomidae and Phyllopoda and, in the first yr. of age, air-insects, Oligochaeta, young larvae of Trichoptera and some algae. In the 2d year, Gastropoda are taken also, as well as larvae of Plecoptera and Ephemeroptera, but Entomostraca still prevail. In the 3d yr., Gastropoda, fully developed insects and parts of Angiospermae predominate. Later on, Cladocera are missing, and the old fishes live chiefly on larger insect larvae. Animals living in the bottom mud, such as *Tubifex* and *Pisidium*, are not taken as food. Sexual maturity of ♂♂ sometimes occurs at the end of the 2d yr., of ♀♀ somewhat later. The period of propagation depends on the temp. In general, it begins in May and lasts till July. Reaches with gravelly or stony ground are preferred for the deposition of the eggs, which number up to 1000. During the early yrs. both sexes grow equally; later on ♂♂ are some-

what stunted in growth. The largest ♀ was 119 mm. long. The minnow is a sociable fish, forming large swarms, and it will also accompany swarms of other spp. In most regions it is associated with trout, although being able to stand higher temp. It is more frequent in western Europe as highland streams afford better conditions than those in the eastern lowlands. The minnow lives in running water as well as in mountain ponds and lakes and even occurs in water of the Baltic containing 1-3% NaCl. As the minnows do not feed on spawn of trout or other fish, its abundance may be a basis for the increase of Salmonidae, younger specimens being a favored food of trout.—*I. Findenegg.*

16546. Tack, P. I., and W. F. Morofsky. A preliminary report on farm pond management in Michigan. *Quart. Bull. Michigan Agric. Expt. Sta.* 28(4): 294-303. 1946.—This report was prompted by the considerable number of inquiries as to the use of commercial fertilizer to increase fish production in farm ponds. On the basis of a 2-yr. (1944-45) study of farm pond management, it is believed that fertilizer of proper composition for the particular body of water will increase the plankton algae, which in turn will increase the insect population—and this is fish food. Careful management of the fish population utilizing the increased food is considered fully as important as using fertilizer to increase the food supply; the number of fish should be kept down to what will insure maximum growth. The fertilizer formula should be detd. for each body of water, or at least for water from several areas of the State. Stocking new ponds should be delayed about 6 weeks after the pond is filled or until the vegetation is thoroughly decayed.—*Courtesy Exp. Sta. Rec.*

16547. Tubb, J. A. The Tasmanian scallop (*Pecten medius Lamarck*). 1. First report on tagging experiments. *Australia Coun. Sci. and Indust. Res. Jour.* 19(2): 202-211. 3 fig. 1946.—Expts. were made in the D'Entrecasteaux Channel of s.-e. Tasmania. 1000 live scallops were marked by glueing a numbered celluloid disk with gutta-percha to the shell, and returned to 5 beds. Of these, 52 were recovered by fishermen in periods varying from 24 to 124 days. Over half of these, 40 of 199 placed, came from the one bed most actively fished. An attempt was made to measure shell growth but results were inaccurate due to sloughing of edges after death of the scallops. The maximum growth in 124 days was about 4 mm.—*T. L. Bissell.*

16548. 29th Annual Report of the State Game Warden and 8th Annual Report of the Game and Inland Fish Commission. 54p. 7 fig. Baltimore: Maryland, 1946.

16549. Van Horn, Willis M., and Max Katz. (Inst. Paper Chem., Appleton, Wis.) Pyridylmercuric acetate as a prophylactic in fisheries management. *Science* 104(2710): 557. 1946.—Pyridylmercuric acetate (PMA) in great dilutions may possibly be used to control infections in fish hatcheries. *Notropis atherinoides* with an unidentified infection were treated with PMA. A group of 28 fish in 0.05 ppm. of PMA had a 75% survival; 28 fish in 0.1 ppm., 78% survival; 19 fish in 0.15 ppm., 96% survival. The water temp. was 12°C; pH was 7.38 to 7.72; and methyl orange alkalinity was 266 ppm. There were only 9 survivors of 17 untreated controls.—*H. M. Kaplan.*

16550. Various Authors. Northwest Canadian fisheries surveys in 1944-1945. *Fish. Res. Bd. Canada Bull.* 72. 1-94. 5 maps, 16 fig. 1947.—This bulletin includes the following sections: Introduction by A. T. Cameron. The Yukon Territory by V. C. Wynne-Edwards. The Mackenzie River by V. C. Wynne-Edwards. Great Bear Lake by R. B. Miller. Great Slave Lake by D. S. Rawson. Lake Athabaska by D. S. Rawson. General Conclusions by J. R. Dymond. For each area there is an account of the physiography, climate, etc., fisheries and recommendations. Accounts of limnological conditions are included for the 3 lakes. The only areas in which commercial fisheries are recommended are Lake Athabaska, Great Slave Lake and possibly the lower Mackenzie. In other areas the fisheries are only sufficient to supply local needs, including angling. The chief commercial spp. are whitefish (*Coregonus*), lake trout (*Cristivomer*) and inconnu (*Stenodus*). Game spp. are grayling (*Thymallus*), lake trout and pike (*Esox*) of large size.—*J. R. Dymond.*

16551. Wilder, D. G. (Atlantic Biol. Sta., St. Andrews, N. B.) The effect of fishing on lobster populations as determined by tagging experiments. *Fish. Res. Bd. Canada*

*Progr. Repts.* 37. 10-14. 1947.—More than 20,000 legal-sized lobsters were tagged in the Maritime Provinces during the spring, fall, and winter seasons of 1942 through 1946 to detn. the amt. of fishing mortality. Greatest returns in fall when the fishing effort was least were explained by the increased activities of lobsters at high water temps. Data for Tignish for 1944-46 show that fishing mortality, which varied from 55 to 77%, was closely correlated with the total number of trap hauls. Fishing mortality of legal-sized lobsters is much greater than natural mortality.—D. G. Frey.

16552. Zeiser, Th. (*Bot. mikrobiol. Inst. Techn. Hochschule, Karlsruhe, Germany.*) Mikrobiologische Untersuchungen an See- und Süßwasserfischen. IV. Über die Keimverteilung auf der Oberfläche von Seefischfilets. [Microbiological investigations on marine and freshwater fishes. IV. Distribution of bacteria on the surface of filets.] *Zentrabl. Bakt. II. Abt.* 106(1/4): 1-4. 2 fig. 1943.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 16433, 16466, 17864, 17885, 18461, 18668, 18677, 18679, 18680, 18681, 18689, 18690, 18697, 18698, 18699, 18700, 18703, 18707, 18709, 18725)

16553. Bick, George H. (*Cornell U., Ithaca, N. Y.*) The wild turkey in Louisiana. *Jour. Wildlife Management* 11(2): 126-139. 1947.—The original range of the wild turkey in Louisiana comprised 40 parishes and approx. 28,000 sq. miles and occurred in the 2 large blocks constituting (1) all of the State east of the Mississippi River and n. of Lake Pontchartrain, (2) that portion n. of an irregular line drawn from the n.-w. corner of West Feliciana to the s.-w. corner of Calcasieu Parish. The 1942 population was 158 flocks which occupied approx. 1,320 sq. mi. or 5% of the original range. The occupied range consists of small, widely separated and sharply limited units. 78% of the population occurred in bottomland hardwood forests. 42% of the population was found on or just adjacent to protected areas; these were the Singer Ayer Refuge, the Morehouse Refuge, and the Urania Forest. Significant turkey populations were associated with a low human farm population. The av. size of the farm and the av. % of the parish in cultivation were identical for occupied parishes and for the State average. The Singer-Ayer Refuge can not be considered as permanent range because of encroaching agriculture. It is suggested that the turkey population here be removed to areas where permanent management is possible. The creation of management areas is suggested for 4 areas within the occupied range: (1) the juncture of Winn, Caldwell, and LaSalle Parishes; (2) the northern part of Livingston Parish; (3) the Pearl River bottomlands in St. Tammany and Washington Parishes; (4) the West Bay area of Allen Parish. Restoration in unoccupied areas should be centered in the north-central part of the State where the range is for the most part suitable and where federal forest land is available. Restoration can be accomplished but extreme steps and an aggressive action program is required.—G. H. Bick.

16554. Edminster, Frank C. The ruffed grouse. 385p. 56 pl. MacMillan Co.: New York, 1947. Pr. \$5.—Largely the results of extensive field studies on about 3000 acres of abandoned farmland and 2d-growth beech-birch-maple-hemlock forest near Ithaca, New York, from 1930 to 1941. Following a popularized general account of the ruffed grouse's life history are presentations of basic ecological and management data. Shelter is considered the probable principal factor limiting abundance in the northeastern states. For optimum benefits, overgrown land or slashings and uneven aged hardwoods, mixed woods and coniferous woods must be thoroughly interspersed with all points within 300 ft. of an edge. Extensive areas of continuous woodlands may be improved by properly spaced clear-cut areas. Protection from grazing, half-cutting small trees, light release cuttings of conifers, woods border establishments, creation and maintenance of 30-ft. wide woods roads, slashings, preservation of selected "weed tree" species and provision of drumming and dusting places are among the forest management measures suggested for use where consistent with the primary economic values of the area. The range carrying capacity, rather than predators, disease or other apparently limiting factors, generally seems to determine grouse populations. Carrying capacities vary from 4 to 20 acres per bird. Ten to 100-acre refuges are occasionally warrantable. While abnormal

weather conditions may prove disastrous to young grouse, average early-season losses are still not fully explained. All notable grouse declines in New York since 1890 occurred after 2 yrs. of severe Feb.-Mar. snow and cold conditions followed by a very cold June. The details however, were not uniform and the declines do not seem to follow a truly cyclic pattern. No authentic case is known of grouse being killed in snow roosts by imprisoning ice, despite hearsay to the contrary. Red and gray foxes, the great horned owl, 2 weasels and several accipitrine hawks take many grouse, but predation is not a limiting factor. Expts. in predator control show definitely that such control is costly and of negative value; the "vermin"-shooting hunter is a detriment to grouse conservation. A number of diseases and parasites affecting grouse are discussed, but disease is not considered to be a general primary mortality agency. Grouse foods, especially the plants, are discussed in detail but deaths due to starvation were found negligible. Both chicks and adults are independent of open water.—G. A. Petrides.

16555. Kelker, George Hills. (*Utah State Coll., Logan.*) Computing the rate of increase for deer. *Jour. Wildlife Management* 11(2): 177-183. 1947.—Reliable deer censuses may be used to determine 4 values relative to reproduction, namely: (1) The average annual rate of increase ( $r$ ); (2) The annual gain (%),  $i = r - l$ ; (3) The no. of fawns per doe in winter ( $y$ ), where  $y = 2(r - l)$ ; and (4) the survival no. of fawns per adult doe in winter ( $y'$ ). The paired values of  $y - y'$  are: 0.4-0.5, 0.7-1, 1-1.5, and 1.3-2. After the derivation of  $y$ , the corresponding value of  $y'$  is found by interpolation. A high value of  $y'$  definitely reveals a high fertility during the previous summer, whereas a low value of  $y'$  indicates either low fertility or unusual losses. The basic formula is  $P = Ar^t$ , where  $P$  is final population growing from  $A$  pop. in  $t$ -years at rate  $r$ . Also,  $r = 1 + \frac{1}{y}$ , where the  $\frac{1}{y}$  indicates even sex ratio, and is termed the "female fraction". If all ♀ yearlings are sterile, the max. value for each of the 4 terms is:  $r = 1.66$ ;  $i = 66\%$ ,  $y = 1.34$ ; and  $y' = 2$ . These 4 values were very closely approximated by a deer herd in its first 6 years on the Ed. S. George Reserve, Ann Arbor, Mich. A typically hunted herd in Utah had comparable values of 1.155, 15.5%, 0.31, and 0.4. In contrast,  $r$  averaged 0.924 for a 10-yr. period during the decline of the Kaibab deer herd. This means the herd lost 7.6% of its pop. each year. When  $r < 1$ , it is called "rate of survival". The calculations are illustrated by use of numbers and logarithms.—G. H. Kelker.

16556. Kellogg, Chas. E. (*U. S. Fish and Wildlife Serv., Chicago, Ill.*) Muskrat pelts: sectional and seasonal effects on grades. *Jour. Wildlife Management* 11(2): 153-161. 1947.—Pelts from muskrats (*Ondatra zibethica*) trapped over a 3-yr. period on several selected National Wildlife refuges in various parts of the U. S. were graded by experts of 2 fur auction companies. There were 204 grades according to size, quality of fur and skins, damage, condition of pelt, and kits. Skins were segregated by semi-monthly periods for the entire trapping season. The terms "spring", "winter", and "fall" are fur-trade terms that reflect the degree of primeness, or relative freedom from pigment on the flesh side of the skin. In the northern areas the % of "fall" skins is quite high until the last 2 weeks of Dec. and the "spring" skins do not exceed 50% until about Feb. 1. The Louisiana section has only a slight fluctuation throughout the trapping season. There is some variation of these primeness grades from one season to the next. In grading for size, a quick estimate must be made of relative square inches of surface and note must be taken as to whether the skin is uniformly and naturally stretched. A XXXL skin from Louisiana is not as large as a XXXL from one of the northern states. The names of sections of the country where skins are produced indicate fur quality to fur tradesmen and similar descriptions as to amt. and quality of fur indicate possibly 2 widely different types of skins when taken from widely different areas. Damage to muskrat skins increases sharply after Mar. 1 (initiation of breeding season) and in some cases amounts to as much as 50%. Percentage of "kits and mice" (skins from very young animals) is somewhat larger in the fall except in Louisiana where it is constant. On basis of value of each grade, weighted average per-skin values, by semi-monthly periods for an entire trapping season (11,433 skins) at Tule Lake Refuge (Calif.) shows that these values

after Jan. 1 were within 3% of the highest average value for any weekly period during the remainder of the trapping season. The large % of damaged skins during the spring was responsible for this lower price. The conclusion to be drawn is that at Tule Lake (Calif.) delaying trapping beyond the middle of Jan. adds nothing to pelt values during seasons similar to that of 1943-44.—*C. E. Kellogg.*

16557. Kossack, Charles W. Incubation temperatures of Canada geese. *Jour. Wildlife Management* 11(2): 119-126. 1947.—Methods were devised using a Leeds and Northrup Pyrometer, with a scale reading 0° to 150°C, a switch panel, 7 pairs of leads (each 150 ft. long) with hot wire thermocouples, and a cold junction in a thermos bottle of ice and water at 0°C. A veterinary-type clinical thermometer and a standard mercury thermometer were used to obtain the temps. of the top and bottom surfaces of Canada goose (*Branta canadensis*) eggs during incubation, the temp. of the developing embryo, the temp. of the breast of the incubating bird and the maximum temp. reached in the nest at any time while the bird was on the nest. In 1 instance the thermocouple junction was in the air cell compartment of the egg when the embryo pipped through the shell. The average incubation temp. of the embryo was 101.3°F, and the temp. rises with the development of the embryo. The av. shell temp. was 100.4°F. The construction of the nest is a vital factor in regards to the top and bottom temp. The av. breast temp. of the incubating goose is 101.1°F. The av. maximum temp. reached in the nest 101.5°F and the av. incubation period 26 days. There is a slight variation among various birds. A few cloacal temps. were taken of incubating, post-incubating and non-breeding geese. The incubating birds having the lowest temps., the non-breeding the highest temps.—*C. W. Kossack.*

16558. Kostrůň, K. (Dept. Zool., Sch. Agric. and Forest., Brno, Czechoslovakia.) Vyskyt bobra vislanského Castor fiber vistulinus Matschie v pusté wiadotupické na severním Polesí. [The occurrence of beaver in Wiadotupic pusztai.] [In Czech with Ger. summ.] *Práce Moravské Přírod. Společnosti (Acta Soc. Sci. Nat. Marov.)* 12(9): 1-16. 2 fig. 1940.—A description of the White Russian locations of beaver colonies. Protection of the species and further management measures are briefly discussed.—*B. A. Kvičala.*

16559. Latham, Roger M. (Pennsylvania Game Comm., Harrisburg.) Differential ability of male and female game birds to withstand starvation and climatic extremes. *Jour. Wildlife Management* 11(2): 139-149. 1947.—As a possible explanation for uneven sex ratios and the resulting phenomena of polygamy or monogamy, the physiological differences mentioned in the title were investigated for 4 polygamous game spp. (*Phasianus colchicus torquatus*, *Bonasa umbellus*, *Meleagris gallopavo*, and *Anas platyrhynchos*) and 2 monogamous game spp. (*Colinus virginianus* and *Perdix perdix*). Various artificial meteorological conditions (high and low temps., winds, rains, and variable humidity) were combined with complete fasting to effect the ultimate death of all of the 1,332 exptl. birds. Nestling and adult sex ratios for 18 avian spp. are given. The 33 expts. pointed toward a significant difference between the sexes in their ability to withstand fasting and climatic extremes under artificial conditions. Among polygamous spp., the ♀♀ proved the stronger; and among monogamous spp., the reverse was the case.—*R. M. Latham.*

16560. Leopold, Aldo, Lyle K. Sows, and David L. Spencer. (U. Wisconsin, Madison.) A survey of overpopulated deer ranges in the United States. *Jour. Wildlife Management* 11(2): 162-177. 1947.—The data were gathered from literature and by correspondence. Of 47 states having deer, 30 register over-population trouble; only the southeast is free from excess deer. All 3 types (whitetail, mule, and Columbian blacktail) exhibit irruptive behavior, culminating at its worst in starvation of the deer and decline of browse food plants. Irruptions are of recent origin, and differ from ordinary winter die-offs. Although some departures occur in local cases, the sequence of events is frequently as follows: distress in inferior browse; consumption of worthless browse; malnutrition, disease and parasites; distortion of age-classes corresponding to fawn die-offs; starvation of adult deer and range based on carrying capacity. The causes of irruptions are mainly predator-control, buck laws, loggings, and forest fire. About a decade after the inauguration of fire control and the cessation of logging, there is often a

closure of tree crowns which reduces the supply of browse and the carrying capacity of the range. Deer are socially tolerant and therefore do not disperse when over-abundant, as other species do. In the past, predator attack frequently forced deer to scatter. Mild winters, artificial feeding, and downed tops from logging often postpone, but never prevent, the ultimate shrinkage of both the herd and its range. The malnutrition which follows large-scale consumption of inferior browse causes a deterioration in both wt. and antler development. Only about 1/10 of the known problem areas are reported as stabilized as of 1945. Most of the remedial reductions have been too late, too light, or too intermittent to accomplish their purpose.—*Aldo Leopold.*

16561. Rausch, Robert. (Michigan State Coll., East Lansing.) Pullorum disease in the coot. *Jour. Wildlife Management* 11(2): 189. 1947.—A specimen of coot (*Fulica americana*), collected March 8, 1945, at Buckeye Lake, Ohio, was found to be infected with pullorum disease. Typical lesions of the ovary were noted, and a pure culture of *Salmonella pullorum* was recovered. This is the first record of this disease from a member of the avian family Rallidae.—*Robert Rausch.*

16562. Rausch, Robert. (Michigan State Coll., East Lansing.) Suggestions for the handling of certain mammals. *Jour. Wildlife Management* 11(2): 189. 1947.—In order to facilitate handling, live-trapped wild mammals were driven from box traps into a mesh sack, and while thus restrained, were injd. intraperitoneally with pentobarbital sodium. The recommended dosage of 1 grain of drug per pound of body wt. was used. Wts. were estimated in the field. Injns. were not made aseptically, but no infection resulted. The method was used on raccoons, woodchucks, fox squirrels, and cotton-tails. Skunks were induced to enter a cardboard box, and chloroform or ether was introduced. The animal was thus anesthetized without the ejection of scent.—*Robert Rausch.*

16563. Schoffman, Robert J. (Fenwick High Sch., Oak Park, Ill.) Food of game ducks at Reelfoot Lake, Tennessee. *Jour. Tennessee Acad. Sci.* 22(1): 4-8. 1947.—149 stomachs of 10 spp. of ducks were analyzed. Collections were made during the hunting seasons of 1943, 1944, and 1945. Seeds of 24 spp. of plants were taken as food and 4 spp. which provided 10% or more accounted for 12% of the total volume. The evidence presented indicates sufficient food plants to support its duck population.—*R. J. Schoffman.*

16564. Titus, Harold. Timber and game—twin crops. *Trans. North Amer. Wildlife Conf.* 10: 146, 163. 1945.—There is increasing and encouraging evidence that relations between sportsmen and timbermen have been improving. In the past, both followed methods which endangered the future of both timber and game. Both made many mistakes. In the past, it was noted that dense stands of heavy timber were virtually biological deserts; the forest game that was present occupied the border zone. By accident, certain regions were logged in such a manner as to vastly increase this so-called "edge effect." Biologists now realize that the abundance of forest game spp. is entirely dependent upon the amt. and type of edge. Thus, we have learned by experience that we can harvest both our forests and our game and still retain them. Modern ideas of sustained yield logging such as rotation cutting or selective logging dovetail exactly with the game managers views of increasing the carrying capacity of an area by increasing many-fold the amount of "edge." Game is to be recognized as a cash asset and a crop like timber and both must be harvested intelligently.—*W. R. Anderson.*

16565. Vogt, William. Man and the earth. (El hombre y la tierra.) No. 32. Biblioteca Enciclopedia Popular. 94p. Secretaría de Educación Pública: Mexico. Also: Pan American Union, Washington, 1944. Pr. 25 cvs.—The dynamic character of this little book is evident from the titles to its chapters: Land, the Guardian of Man; Fruits of the Earth; Mexico Is Thirsty; The Soil, Fountain of Life; The Web of Life; Only God Can Make a Tree; Pasturage; I Will Lift Up Mine Eyes to the Mountains; The Land Belongs to All the People. In simple, forceful language, illustrated by a few telling sketches, the author asserts the simple, but largely forgotten truth, that man depends entirely on the earth. He describes the deforestation, progressive desiccation, overgrazing, erosion, and slaughter of birds and other wild life in Mexico, and he points out the fate of nations that have violated the laws of nature. His emphasis, how-



ever, is on the constructive side; he dwells upon the pride of the Mexicans in the beauty of their country, he mentions the rewards to be expected from tourist travel to National Parks and a smiling countryside; and he dilates upon the benefits that will come from working with nature instead of

exploiting her. An admirable, eloquent presentation of this all-important matter, well calculated to impress and educate the school children and adults of Mexico. Peru and Chile also plan to use versions of this book.—*M. M. Nice* (courtesy *Bird Banding*).



# BIOLOGICAL ABSTRACTS

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## GENERAL BIOLOGY

A. H. GRAVES, *Editor*

(See also Entries 18764, 18768, 18783, 20369, 20422, 20617)

### PHILOSOPHY OF BIOLOGY

18738. Burr, H. S. (*Yale U., New Haven, Conn.*) Field theory in biology. *Sci. Month.* 64(3): 217-225. 1947.—Extreme complexity combined with extreme precision in the structure and behavior of organisms, notably in the nervous system, suggested a search for effective controlling forces. A technique for the accurate measurement of potential differences between the parts of uninjured individuals has been devised and applied in an exploratory way. In man, there is a difference between the sides of the body, the right being positive to the left in about 90% of the individuals. There are lengthwise differences in corn seed, obelia, salamanders, and mice, and these change consistently during growth. These differences are established in frog and salamander eggs before fertilization. Sinnott found the shape of squashes to be related to ratios of potential differences longitudinally and transversely during development. Rate of growth of corn has been found related to potential differences between the ends of the grain. Long period studies of trees are in progress. It is believed, then, that electric forces are involved in the development, structure, and behavior of organisms.—*H. F. Copeland.*

18739. Herrick, C. Judson. (*U. Chicago.*) Seeing and believing. *Sci. Month.* 64(3): 253-260. 1947.—Certain experience of natural illusions leads the author to suggest as subjects of study, as problems of science and not of metaphysics, the relationship between sensory and mental experience; the nature of scientific explanation; and the function of science in society.—*H. F. Copeland.*

18740. Margenau, Henry. (*Yale U., New Haven, Conn.*) Particle and field concepts in biology. *Sci. Month.* 64(3): 225-231. 1947.—The concept of reality as consisting of particles comes from Newton and from Helmholtz, 1847; Faraday and Maxwell introduced the electric field as a conflicting reality; Lorenz has reconciled these concepts to the effect that one can consider the behavior of a particle with reference to the local field rather than to the entire universe. These ideas are consistent with Burr's observations of electrical fields existing in and about individual organisms.—*H. F. Copeland.*

18741. Smith, H. W. (*New York U. Coll. Med., N. Y. C.*) Plato and Clementine. *Bull. New York Acad. Med.* 23(6): 352-377. 12 fig. 1947.—A philosophic analysis of the meaning of the word normal.

### EXPLORATIONS, EXPEDITIONS, ETC.

18742. Caballero y C., Eduardo. Una excursion científica a la Isla de Guadalupe, Baja California. [A scientific excursion to the island of Guadalupe, Lower California.] *Mem. y Rev. Acad. Nacion. Cienc. "Antonio Alzate"* 55(4/6): 117-125. 4 fig. 1940.—Naturalist's notes on a trip made especially to study the concentration there of sea elephants\* (*Mirounga angustirostris*). It is remarked that due to ingestion of sand which contains particles of quartz and obsidian, the animals are afflicted by gastric ulcers, the site of which is occupied by bacteria and the nematodes *Anisakis similis* and *Contracaecum osculatum*. On the island, the animals get along very well, but in captivity the lesions disappear and with them the parasites, and then other bacteria occupy the

site of the lesion and cause the death of the animal. There are about 1500 sea elephants on Guadalupe and Benitos. Goats and cats, introduced many years ago by Russian whale hunters who established a base on the island, now live there in a wild state, there being more than 10,000 goats, and so many cats that they have finished off the reptiles, birds, and even camp rats. The only bird seen was *Carpodacus amplus*\*. A few notes on vegetation are included.

18743. Murphy, Robert Cushman. Logbook for Grace. Whaling brig Daisy, 1912-1913. 290p. 4 fig. MacMillan Co.: New York, 1947. Pr. \$4.—This is a journal written by the author for his wife while he was engaged in an expedition to the S. Atlantic for the American Museum of Natural History. On July 1, 1912, he left Dominica in the Lesser Antilles on the whaling brig, Daisy. This proved to be his base of operations until he returned to Barbados in the same island group on May 8, 1913. The expedition carried him across the Sargasso Sea to the Cape Verde Is., thence southward. He made a brief visit on Fernando Moronha I. and arrived at S. Georgia I., the expedition's destination, on Nov. 24. Here he remained until Mar. 16 when he began his return northward. The author's chief task was to make extensive collections of animals and plants. Being an ornithologist, he devoted considerable time to the studies of bird habits. At South Georgia the penguins received much of his attention. This book is not a scientific document—the biological findings of the expedition have already been published elsewhere. It is, rather, an account of the author's experiences and impressions; daily life on the Daisy and the activities and social relationships of the crew; harpooning and cutting-in whales and preparing whale oil; gathering seal blubber; collecting and preparing animal specimens; exploring various islands visited; studying and photographing bird life at S. Georgia when opportunities permitted. Though the writing is non-technical, the book contains a wealth of interesting biological information.—*O. S. Pettingill, Jr.*

### INSTITUTIONS, ADMINISTRATION

18744. Derry, H. W. Chemurgic activities for Oregon, 1946. *Chem. Digest* 6(1): 22-25. 1947.—A review of new and continued chemurgic projects, including all kinds of processing of agric. and forest products, both usual and unusual, such as frozen foods, glucose, formaldehyde resins, refrigerator cabinets from logging waste, ethyl alcohol from wood, feed yeasts from waste sulfite liquors, wood extractives, new uses for hops, cull potatoes, flax products. The scale of these projects includes variety trials, science laboratories, pilot plants and huge new investments in actual operations.—*O. J. Worthington.*

18745. Ferreira Reis, A. C. O Jardim Botânico de Belém. *Bol. Mus. Nacion. Rio de Janeiro Bot. Ser.* 7: 1-14. 1946.—A summary of the early botanical explorations of the Amazon area and the events leading to the establishment of the Botanical Gardens in 1798.—*A. C. Wallon.*

18746. Hoveland, Niemen. (*U. Wisconsin, Madison.*) Wisconsin farm research digs deep. *Chem. Digest* 6(1): 18-21. 1947.—The historical motivation and directional forces instigated by the early pioneer Wisconsin research workers are discussed. The characteristics of the research in

agric. and fundamental sciences at this station are described, culminating in the 1946 situation—70 industrial fellowships. Many projects, solved or current, handled in the usual divisions of large agric. expt. stations are listed: e.g., grass silage, feeding value of oat mill feed, early work in diseases of canning peas, paper mill wastes, urea in feeds, hemp, penicillin production, really white casein plastic, breeding new vars., quality vs. minor soil elements, industrial fermentations, rural land-use zoning, etc. More research is done under industrial fellowships than federal grants. The "stringent conditions" required of donors in order to protect the integrity of the institution are enumerated.—O. J. Worthington.

18747. Sparn, Enrique. Cronología, diferenciación, matrícula y distribución geográfica de las sociedades zoológicas. [Chronology, differentiation, membership and geographical distribution of the zoological societies.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 35(1): 111-132. 3 maps. 1940.—A review, based chiefly on material from "Minerva" and "Index Generalis", listing the number of important zoological societies established in each decade since 1820 and the names of those founded since 1850, arranged chronologically with data on membership, journals published, zoological gardens maintained, etc. The data seem incomplete, as for the U. S. the only zoological gardens mentioned are those of New York and San Diego.

18748. Sparn, Enrique. Cronología, diferenciación, matrícula y distribución geográfica de las sociedades botánicas. [Chronology, differentiation, membership and geographical distribution of the botanical societies.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 35(2/3): 135-150. Map. 1941.—A review, listing the number of botanical societies established in each decade since 1820, and the names and dates of those founded since 1850, with information as to their membership, publications, etc.

18749. Sparn, Enrique. Cronología, diferenciación, matrícula y distribución geográfica de las sociedades de mineralogía, geología paleontología. [Chronology, differentiation, membership and geographical distribution of the societies of mineralogy, geology and paleontology.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 36(1): 1-24. Map. 1942.—A review similar to those on zoological and botanical societies. Only 12 paleontological societies, the first having been organized in 1847, are listed. Distribution by countries shows the U. S. having more members in this field than all other countries combined.

18750. Sparn, Enrique. Cronología, matrícula y distribución de las actuales sociedades de historia natural general. [Chronology, membership and distribution of existing societies of general natural history.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 36(2/3): 106-139. 7 maps. 1943.—A review similar to the author's previous papers, but dealing with societies not confined to one field. 266 societies are listed, of which about half have >250 members, and 9 have >1000 members.

18751. Thompson, John W., Jr. (U. Wisconsin, Madison.) How the junior academies of science operate. *Sci. Month.* 64(4): 327-336. 1947.—These statewide organizations chiefly of high school students interested in science have memberships of >1000 in each of the states of Virginia, Florida, Illinois, Indiana, and Wisconsin. Their modest expenses are met chiefly by dues and by subventions from the state academies. Their success depends on adult sponsorship, locally by high school teachers, and in each state mainly by some competent and interested individual.—T. F. Copeland.

18752. Waksman, Selman A. (Agric. Expt. Sta., New Brunswick, N. J.) Microbiology in the U. S. S. R. in 1946. *Sci. Month.* 64(4): 289-296. 6 fig. 1947.—The Academy of Sciences includes an Institute of Microbiology with a staff of 25 scientists devoted to general and soil microbiology; the All Union Institute of Exptl. Medicine deals with medical microbiology; various ministries, schools, and other institutions are contributing. All scientific work was disrupted by the war; microbiological research is now fully active and up to date.—H. F. Copeland.

18753. Anonymous. Removal of John Innes Horticultural Institution. *Gard. Chron. [London]* 118(3075): 225. 1945.—Brief summary of the accomplishments at the Institution, which is to be moved to Bayfordbury, 16 miles

north of London and 1 mile from Hertford, an estate of 372 acres, compared with the original 5 acres at Merton.—C. H. Connors.

# MISCELLANEOUS

18754. Bailey, Liberty Hyde. (Cornell U., Ithaca, N. Y.) Botanical sciences and their applications, including agriculture. *Proc. Amer. Phil. Soc.* 91(1): 22-26. 1947.—The early botanical work in the U. S. was classificatory in nature and provided an inventory without which a valid discussion of objects is impossible. The work was done by a number of brilliant and colorful men of whom Rafinesque and Asa Gray are excellent examples. A trend toward the limitless applications of botany to horticulture and crop growing was begun by Thomas Jefferson. In the past century national and regional plant societies have grown to great importance. But not until 1924 was a manual of cultivated plants prep'd. and today there is only one large publishing herbarium and laboratory in which the whole cultivated flora is on a parity with other floras, and there is no institution in the U. S. training students who may be qualified to join that staff. Hybridization to produce new vars. is commendable but hybridization is of little value for the taxonomic determination of forms. A proper herbarium is necessary for specialized botanical work, and it must be a standardizing influence to all students. The determination of what goes on within the plant cell is still the fundamental problem of biology today.—P. S. Stokely.

18755. Garnet, J. Ros. The establishment of the new national park at Dimboola. *Victorian Nat.* 63(10): 220-221. 1947.—The park area will preserve a remnant of the Mallee flora and fauna.—Olga Lakela.

18756. Higbee, E. C. The agricultural regions of Guatemala. *Geogr. Rev.* 37(2): 177-201. 1947.—The country, with an area about the same as Tennessee, shows as great a diversity of crops as can be found in the whole of the U. S. Differences in altitude, temp., and rainfall are the decisive factors. The country is considered to have 9 agric. regions. A map showing these regions, their extent and distribution has been prepared by using planimeter readings on the Amer. Geog. Society's Millionth Map of Hispanic America. Each of the regions is briefly characterized, and population, health conditions, principal products, and transportation are considered. The Central Highlands, or "tierra fria", have an elevation of 1500-3000 meters and a cool invigorating climate, with very little malaria. They occupy about 18% of the area of the country and have a marked conc. of the Indian population, with small-scale subsistence farming. Holdings are small, often submarginal, and many of the farmers migrate to other regions for seasonal work. Three of the agric. regions are below the 500 m. contour and occupy about 56% of the total area. They contain much of the best agric. land and offer the greatest promise for future development, provided health conditions and transportation are improved. The largest region, Peten and the Caribbean Lowlands, contains 46% of the land, but only 3% of the population. It is mostly forested, the principal products being chicle gum and mahogany. The best soils are found in the Upper Pacific Piedmont (coffee and cinchona), the Lower Pacific Piedmont (sugar cane), and in parts of the Pacific Coastal Plain. Present taxation methods, taxing crops rather than land, are considered unfavorable to the extension of cultivation.—F. W. Foxworthy.

18757. Lee, Douglas H. K. (U. Queensland, Brisbane, Australia.) Terra australis reditiva. *Proc. Roy. Soc. Queensland* 55: 1-10. 1943(1944).—A presidential address, discussing the needs of the future in Australia, in particular the need for a plan for the study of tropical development.

18758. Shapley, Harlow. Liaison with youth. *Sci. Month.* 64(4): 347. 1947.—A plea for a better system of contact between scientists gathered in institutions and their isolated colleagues.—H. F. Copeland.

18759. Simon, Leslie E. German research in World War II. An analysis of the conduct of research. 218p. Illus. John Wiley and Sons, Inc.: New York, 1947. Pr. \$4.—Col. Simon, Director of the U. S. A. Ordnance Dept.'s Ballistic Research Labs. during the war, was sent to German scientific establishments as soon as possible after their capture to collect information and material of immediate and general



value. His *Report on German Scientific Establishments* (Office of Technical Services, U. S. Dept. of Commerce, declassified) he states to be of interest to those requiring such information for scientific work. The present volume presents personal deductions and inferences on the fundamentals underlying the scientific method and the factors affecting the progress and fruitfulness of research and its practical applications. Ch. 2 is devoted to general (non-national) considerations. Much stress is laid throughout on distinc-

tions in theory and practice among basic, technical, fundamental, pure, and applied research; and engineering design, development, and production. Non-ordnance military research and non-military research in Germany are not covered. Col. Simon states that German scientists were well treated by, and may be expected to remain loyal to, the Nazi régime. The book should interest sociologists of technology, science historians, and research administrators, as well as scientists and inventors in general.—*W. F. Hewitt, Jr.*

## EDUCATION

F. R. KILLE, *Editor*

(See also in the section *Apparatus and Technique*; *Visual Instruction in Microbiology, Immunology, and Public Health*; and *B. A. 21(7)*: Entries 18219; and in this issue 18751, 18880, 20016, 20018)

### GENERAL

18760. Aikman, J. M. (*Iowa State Coll., Ames.*) What in ecology is most significant to the biology teacher? The ecologist's viewpoint. *Amer. Biol. Teacher* 9(6): 168-173. 1947.—In ecology, the community concept seems to be the most significant one for the biology teacher. First a class visits and studies a living community, naming observed species and discovering how each species affects others. Then successions are studied, leading to a community in natural equilibrium. Local situations provide teaching materials.—*E. T. Cox.*

18761. Alexander, Gordon. (*U. Colorado, Boulder.*) The integrated college course in General Biology. *Amer. Biol. Teacher* 9(6): 183-186. 1947.—There is wide diversity in college courses of General Biology. Length of instruction varies as much as eight fold and content even more. Some offer no laboratory work, others much. This lack of standardization may indicate that those who teach General Biology do not share a common conviction regarding certain minimum essentials. The course should be organized around those principles fundamental to an understanding of living matter. Such basic concepts are morphological (common constituents of cells, patterns in mitosis, the combinations of cells in tissues, organs, organ systems), others physiological (photosynthesis, respiration, digestion, etc.) and still others are developmental (meiosis, fertilization, differentiation) or genetic. Both plants and animals must be studied or the principle will not appear to the student to be "general." The similarities between organisms are more important than their differences. Which is the more significant observation: that plant cells have cell walls, and animal cells do not; or that both types of cells undergo division by a process in which the chromosomes are halved both quantitatively and qualitatively? Is it more important that plants form cellulose, or that both plants and animals oxidize sugar by the same series of enzyme reactions? The latter in each case is clearly a principle of greater magnitude and greater significance, but it would not be appreciated as a broad concept of life science if taught solely on the basis of plant or animal material. Furthermore, principles in taxonomy can be derived only after a study of a group of organisms and those in ecology involve both plant and animal materials. Courses in which a unit of zoology is followed by a unit of botany should not be called General Biology.—*F. R. Kille.*

18762. Baker, Arthur J. (*Crystal Lake High Sch., Ill.*) Harmonize your testing with the tenets of your teaching. *Amer. Biol. Teacher* 9(6): 180-183. 1947.

18763. Bender, James F. Aptitude testing. *Sci. Month.* 64(4): 297-300. 1947.—There are >1000 standardized tests available, covering intelligence, temperament, and interests. Most people are capable of success in a wide variety of vocations. Test results will not dictate vocation, but will help a person make a choice.—*H. F. Copeland.*

18764. Brandwein, Paul F. (*Forest Hills High Sch., N. Y.*) The selection and training of future scientists. *Sci. Month.* 64(3): 247-252. 1947.—At Forest Hills High School, all students take general science in the 1st yr. and most take biology in the 2d yr. At the end of the 1st semester in biology, a fraction of the class, from about  $\frac{1}{10}$  to about  $\frac{1}{6}$ , are selected by grades, special tests, and hobby interests to be in special classes allowing individual work, the exploration of techniques, and actual original study. These classes, from which many students drop out, are carried through the

remaining years of high school. About 1% of the entering students appear qualified to become professional scientists. It is hoped that the colleges to which these students go will take advantage of the selection and special training which this school offers.—*H. F. Copeland.*

18765. Brewer, George E. F. (*Marygrove Coll., Detroit, Mich.*) Bridging the gap between study and professional work. *Metropolitan Detroit Sci. Rev.* 7(3): 26, 52. 1947.—To enable students to make the transition from college work to professional fields, a program supplementary to the science curriculum is planned at Marygrove College. Its purpose is to familiarize them with the requirements of professional work. In the program outlined, students make contacts with situations and problems comparable to actual professional work.—*Sister Rose Angela Mayer.*

18766. Douglass, Minnie G. (*Lafayette High Sch., Brooklyn, N. Y.*) A unit on conservation in high school biology. *Amer. Biol. Teacher* 9(5): 133-137. 1947.—For students not taking regents' examinations, 3 weeks of the biol. course are devoted to conservation of forests, animals, and soil with an emphasis on interdependence and the need for a coordinated planning authority. Student is taught that any change anywhere has repercussions on life everywhere, sporadic attempts at conservation may do more harm than good, farm and forest practices affect cities, and the importance of the outdoors to city folks. One topic is outlined and a full bibliography is given.—*E. T. Cox.*

18767. Hinton, Taylor. (*Amherst Coll., Mass.*) Suggestions for laboratories in college courses in genetics. *Turtox News* 25(1): 12-16; (2): 41-45. 1947.—Expts. with *Drosophila* crosses are outlined which have been devised to illustrate scientific method, techniques of genetics, principles of heredity, and to present problems for student analysis and solution.—*R. W. Dexter.*

18768. Krecker, Frederick H. Woods and trees: Philosophical implications of some facts of science. *Ann. Rept. Smithsonian Inst.* 1944(3788): 307-316. 1945.—The author, a teacher of zoology, asks himself at the close of the academic year, "What have I conveyed to my charges?" He likens the facts of science to the trees and the great implications of science to the woods, and queries "... have I been content to show to my students merely the trees of fact, ... or have I also taken them to a vantage point and shown them the beauty and majesty of the forest?" For example, the doctrine of organic evolution is supported by a host of meticulous details which may be presented as ends in themselves, or as a means to an end—a reorientation of human conceptions. Organic evolution has once and for all destroyed the concept of immutability of human institutions as well as of animal bodies. If man as an animal is the product of change, his institution, the state, as a sociopolitical organization is not immutable. Specialization and responsibility go hand in hand. Action for self alone must be surrendered to a sense of allegiance to the group.—*R. Dobbins.*

18769. Lacroix, Donald S. (*Amherst High Sch., Mass.*) Summer school at the Audubon nature camp. *Amer. Biol. Teacher* 9(5): 141-144. 7 figs. 1947.—Brief descriptions of 2-weeks' courses in nature study, bird study, marine biology, plant biology and insect biology offered by the Audubon Nature Camp located in Muscongus Bay on the coast of Maine. Conservation of wildlife resources and the interdependence of plants, animals and man are stressed. Instructors are specialists in each field. Students are science

supervisors, kindergarten and grade school teachers and nature-lovers. No academic credit is given.—E. T. Cox.

18770. McMurty, Edna Hewes. (*Wellsville High Sch., N. Y.*) Conservation education in a special science class. *Amer. Biol. Teacher* 9(5): 138-139. 1947.—Biology constitutes a large part of the science course in a special curriculum designed for physically handicapped students. An outline of the subjects for class, field trips and classroom museum stresses conservation and citizenship responsibility.—E. T. Cox.

18771. Michaud, Howard H. The teaching of ecology from the biology teacher's standpoint. *Amer. Biol. Teacher* 9(6): 164-167. 1947.—To meet the need for the interpretation of some of the simpler ecological concepts in terms that can be understood by the high school ecology student, college ecology courses should lay more stress on adequate interpretation for teachers and texts should explain the simpler ecological terminology. The author gives several examples of ecological thinking which can be understood easily by the layman and the high school student. Nature study presented a simplified ecology with a practical purpose and a modern slant has been neglected in the high school course.—E. T. Cox.

18772. Noland, Lowell E. (*U. Wisconsin, Madison.*) What in ecology is most significant to the biology teacher? A zoologist's viewpoint. *Amer. Biol. Teacher* 9(6): 176-177. 1947.—In an elementary college zoology course, the approach to ecology is by way of the animal body. This course is followed by one devoted to the local fauna with emphasis on ecology whenever possible. The things in ecology of most significance to the high school biology teacher are those which give meaning to the structure and function of the animal body, and to the processes of evolution which aid in the survival of the species in nature.—E. T. Cox.

18773. Shimer, Hervey W. (*Massachusetts Inst. Tech., Cambridge.*) What in ecology is most significant to the biology teacher? Paleocology. *Amer. Biol. Teacher* 9(6): 178-180. 1947.—Paleocology furnishes impressive evidence of the continuity of biol. and geol. conditions under which organisms have lived and died for many millions of years.—E. T. Cox.

18774. Stevens, Neil E. (*U. Illinois, Urbana.*) The place of plants in elementary ecology. *Amer. Biol. Teacher* 9(6): 173-174. 1947.—The place to begin the study of ecology is the relation of green plants to the inorganic environment, since they are an indispensable element in the en-

vironment of all animals. Then study those animals that contribute to plant welfare, then food chains, etc., and emphasize the fact that each organism affects all others.—E. T. Cox.

18775. Stimson, Dorothy. (*Goucher Coll., Baltimore, Md.*) A case report on a history of scientific ideas. *Sci. Month.* 64(2): 148-151. 1947.—The results of an elective course in the history of science, requiring  $\frac{1}{3}$  of the time of about 20 junior and senior students during the first semester of each of the past 25 yrs. at Goucher College, were studied by means of a questionnaire. The course appears to have been valuable both to scientific students and to others, by stimulating thought, showing what science is, showing relationships between fields, establishing an enduring interest, and making the student more interested in and interesting to others.—H. F. Copeland.

18776. Van der Schalie, Henry. (*U. Michigan, Ann Arbor.*) The ecology of mollusks for the biology teacher. *Amer. Biol. Teacher* 9(6): 174-176. 1947.—Biology teachers could make significant contributions in research in this field by listing species in small local areas of uniform character and giving information about soil and vegetation.—E. J. Cox.

18777. Weaver, Richard Lee. (*Amer. Nat. Study Soc., Chapel Hill, N. C.*) The teaching of ecology from the nature study viewpoint. *Amer. Biol. Teacher* 9(6): 162-164. 1947.—At the turn of the century nature study began to mean the interest in and study of nature in the wild rather than in rooms and books. An ecological approach lets one introduce such dynamic topics as predatory relationships, food chains, balance of nature, successions, etc. Piecing together the owl-skunk-turtle eggs-berries-owl pellets food chain, for example, leads a student to an appreciation of the essentials of life. Professionals should discover the ecological facts of nature and The Nature Study Society and similar educational groups should apply these facts to teaching situations. Conservation workshops or laboratories are suggested for the improvement of teacher-training.—E. T. Cox.

#### VISUAL INSTRUCTION

18778. Richards, O. W. (*Box A, Buffalo 15, N. Y.*) 13th report of the committee on motion pictures. *Jour. Biol. Photogr. Assoc.* 15(3): 161-162. 1945.—Twelve films, catalogs of film sources and publications of interest are listed.—O. W. Richards.

## BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 18745, 18754, 18948, 19208, 20422, 20617, 21226)

### HISTORY

18779. Chardon, Carlos E. Longevity and casualties among naturalists in tropical America. *Sci. Month.* 64(3): 193-207. 6 fig. 1947.—Four 16th-century Spanish chroniclers who observed natural history in America, namely Oviedo, las Casas, Acosta, and de la Vega, reached an average age of 77 yrs. and 6 mos. Twelve distinguished 17th- and 18th-century naturalists reached average ages of 70 yrs. and 9 mos. Humboldt and Bonpland, in America 1799-1804, lived, respectively, to 90 yrs. and 85. 153 naturalists of the 19th and 20th centuries included at least 20 octogenarians; their av. age was 67.7 yrs. It appears that the usual temperament of naturalists and their opportunities in tropical America counteract the supposed unhealthiness of this area.—H. F. Copeland.

18780. Frantz, L. Oesterreicher in Brasilien. Wissenschaftliche Forscherarbeit im 19. Jahrhundert. [Austrians in Brasil. Scientific research work during the 19th Century.] *Universum* 1946/47(8): 196-198. 4 fig. 1947.—An account of the share Austria took in the cultural development, particularly of sciences, in Brazil during the first half of the 19th Century. Besides the Empress Leopoldina, daughter of Emperor Francis I of Austria, who favored work in natural sciences and to whom the palm genus *Leopoldina* was dedicated, the names of Natterer, Pohl, Mikan, Schott, Sochor, Buchberger, Ender, and Schuch are most representative of Austrian work in Brazil at that period.—Max Onno.

18781. Izquierdo, José Joaquín. Panorama evolutivo de la medicina científica. [Evolutionary panorama of scientific medicine.] *Mem. y Rev. Acad. Nacion. Cienc. "Antonio Alzate"* 55(10/12): 315-323. 1944.—An informal historical review of the development of the idea of experimentation in medicine.

18782. Rosen, G. Leonhard Ludwig Finke: On the different kinds of geographies, but chiefly on medical topographies, and how to compose them. *Bull. Hist. Med.* 20(4): 527-538. 1946.—An introduction contains a brief biographical sketch of Finke and a description of his 3-volume *Geographie*. A full translation of the introductory section to Vol. III (published in 1795) is given.—Frederick Sargent.

18783. Shryock, Richard H. Trends in American medical research during the nineteenth century. *Proc. Amer. Phil. Soc.* 91(1): 58-63. 1947.—In the early 19th century American medical institutions enjoyed a universal approbation in that era in which medical thought was dominated by arm-chair scholars with their "systems" and universal remedies. The introduction of clinical and pathological investigations into French and German schools left America far behind. Moral convictions against human dissection and the disinclination of the American people to support scientific work without apparent utility prevented this new type of research from taking hold in this country. Along with the discoveries of Koch and Pasteur came the industrial revolution and wealth to America. Medical men were be-

ginning to realize that "pure science" promised advances in prevention and cure of disease. Medicine and public health became the chief objects of philanthropy. The need at present is to shift the focus of research from infectious diseases in the direction of chronic and degenerative disorders. This country now faces the opportunity of exchanging students and knowledge freely with all other progressive lands.—*P. S. Stokely.*

18784. Van Dyke, H. B. (Columbia U., N. Y. C.) The weapons of Panacea. *Sci. Month.* 64(4) 322-326. 1947.—The first work resembling a modern pharmacopoeia was the Florentine *Nuovo Receptario* of the late 15th century. The first synthetic organic compound used in medicine was ether, about 1850; the first laboratory of pharmacology was established about this time. The use of specific organic compounds as drugs and the continuous introduction, on the basis of adequate tests, of new ones, are modern developments.—*H. F. Copeland.*

18785. Whyte, A. Hedley. Proctology past and present. *Proc. Roy. Soc. Med.* 40(4): 179-184. 1947.—An historical sketch starting with Cingalese records of hospitals in Ceylon as early as 437 B.C. Mention is made of the treatment of bleeding piles recommended in the *Susruta* (5th Cent. A.D.) a great Brahminical work. After Galen (131-202) European medicine remained at a dead level for nearly 14 centuries. Of special interest to proctologists are Oribasius (325-403 A.D.) of Constantinople, Avenzoar of Cordova who died at Seville in 1162 (his name is associated with rectal feeding), John Aderne who performed a classic operation for fistula in 1376 and the French physicians, Félix, who operated on Louis XIV (1688), and Littré who proposed colostomy (1710). Frederick Salmon (1796-1873) is called the father of proctology. He established in 1835 the "Infirmary for the Relief of the Poor Afflicted with Fistula and Other Diseases of the Rectum." For 22 yrs. he did all the surgery at the hosp. single handed. He left a great hosp. and his great book "Practical Treatise on Stricture of the Rectum" which describes his ligature operation. The sketch continues, giving the highlights of modern surgery, noting particularly cancer of the rectum.

#### BIBLIOGRAPHY

18786. African Wild Life. Volume 1, Number 1, October 1946. Chairman, Magazine Committee: B. A. Key. Society President: J. H. Orpen. Quarterly. 88 pages (8 articles) in the first issue. Published by the Wild Life Protection Society of South Africa, P. O. Box 1742, Johannesburg, South Africa. Subscription price: 10s. 6d.—The following papers comprise this issue: Why do we practice wild life conservation, by R. Bigalke; "Oom Paul's" great fight to preserve game, by H. P. H. Behrens; Lions . . . as I knew them, by J. Stevenson Hamilton; The birds of Bon Accord, by L. Chippindall; Die Transvaalse geelvis, by T. G. Nel; The Cape Dussie, by A. D. Thomas; A case for the barn owl, by F. F. Kolbe; and The Vaal Ribbok of South Africa, by Austin Roberts.

18787. Botanical Bulletin of Academia Sinica. Volume 1, Number 1, March 1947. Editor: S. C. Teng. Editorial Board: T. L. Loo, Chin-Chih Jao, Chien P'ei, H. W. Li, R. H. Shan, and F. H. Wang. Quarterly. 79 pages (8 articles) in the first issue. Published by the Institute of Botany, Academia Sinica, 320 Yoyang Road, Shanghai,

China. Subscription price: \$5.—The following papers comprise this issue: Noteworthy plants of Szechuan and Sikang, by Chien P'ei; Changes of carbohydrates of germinating wheat seeds in manganese sulphate, indole-acetic acid and colchicine media, by Chen-Chung King; Additions to the Myxomycetes and the Carpomycetes of China, by S. C. Teng; Some Characeae from Kunming, Yunnan, by Chin-Chih Jao; Kwangtung species of Hibiscus, by Tien-Hsiang Ho; Studies on *Oncosaccus tetrasporioides* gen. et sp. nov., by Chin-Chih Jao; Studies on the freshwater algae of China. XIV. Some freshwater algae from Ksuan, by Chin-Chih Jao; and New Cyanophyceae from Northern Kwangtung, by Shang-Hao Ley.

18788. Clínica Tisiológica. Volume 1, Number 1, April-June, 1946. Editor-in-Chief: J. M. Castello Branco. Directors' Commission: Reginaldo Fernandes, Walter Mendes, and E. Werneck Hirsch. Quarterly. 154 pages (6 articles) in the first issue. Published at Rue Araujo Porto Alegre, 70—Sala 210, Caixa postal, 4149, Rio de Janeiro, Brazil. Subscription price Cr. \$60.00.—The following papers comprise this issue: Campanha nacional contra a Tuberculose, by R. Fernandes; Clínica da tuberculose primária do adulto, by Reginaldo Fernandes; Hemorragia secundária grave após pulmonolise intrapleurar. Reinfusão do hemotórax, by J. M. Castello Branco; O emprego do mastruco nas bronquites catarrais, by Deodoro Fonseca de Carvalho; A tisiocirurgia no Hospital Miguel Pereira, by J. M. Castello Branco, J. Batista Rocha, and H. Murga Filho; and As atividades do Hospital Miguel Pereira, by Reginaldo Fernandes.

18789. The Indian Journal of Physiology and Allied Sciences. Volume 1, Number 1, January 1947. Editors: N. M. Basu, B. B. Sarkar, and N. N. Das. Editorial Board: B. Ahmad, M. A. Basir, S. M. Banerjee, S. L. Bhatia, K. P. Bose, W. Burridge, B. Narayan, R. K. Pal, S. A. Rahaman, K. C. Sen, P. B. Sen, and Indrajit Singh. 45 pages (5 articles) in the first issue. Published by the Physiological Society of India, University College of Science, 92, Upper Circular Road, Calcutta, India.—The following papers comprise this issue: Effect of cardiac drugs on heart tissue explanted in vitro, by N. N. Das; Experimental studies on the influence of thiamin (vitamin B<sub>1</sub>) on the inflow of phosphate into, and absorption of glucose from, the intestinal canal, by N. M. Basu and G. K. Ray; Observations on the assay of prolactin by the cropgland stimulation in Indian pigeons, by B. C. Bose and B. Mukerji; Ascorbic acid content of garden rose hips, by K. Mukerjee and K. L. Mukerjee; and Influence of vitamin B<sub>1</sub> on detoxication by glucuronic acid produced in liver, by N. M. Basu and G. K. Ray.

18790. Various Authors. Symposium on technical library techniques. *Jour. Chem. Educ.* 24(2): 54-93. 1947.—Punched-card techniques and their applications to scientific problems, by W. J. Eckert; Coding and sorting chemical compounds by means of punched cards, by John A. Morgan, and D. E. H. Frear; Some applications of punched-card methods in research problems in chemical physics, by Gilbert W. King; Recent developments in key-sort cards, by Gerald J. Cox, Robt. S. Casey, and C. F. Bailey; Indexing and classifying results of chemical research in relation to punched-card investigations; Present-day problems in obtaining foreign scientific publications, by Verner W. Clapp; and Problems of classifying chemical patents, by Manuel C. Rosa.—*Greta Oppe.*

#### EVOLUTION

ALFRED EMERSON, Editor

(See B. A. 21(7): Cytology and speciation, Orchis, 16285; Genetics of natural populations, *Drosophila*, 16330; *Plectognathi*, 18647; Fossil fish, S. America, 18662; Avian evolution, 18682; Variation in birds, Galapagos Is., 18683; Phylogeny of Pelecaniformes, 18684; Rhinoceros, 18722; and in this issue Sexual coaptations in Oniscoidea, 21026; Dispersion of Isopoda, 21038; Proventriculi of insects, 21054; Phenotypic races of Coleoptera, 21060, 21061, 21070; Phylogeny of lice, 21167; Geol. history of plants and vertebrates, 21169)

18791. Bertrand, Paul. Les trois aspects de la loi de recapitulation ontogénique et phylogénique chez les végétaux. [Recapitulation of phylogeny in ontogeny, three aspects of it in the plant kingdom.] *Boissiera* 7: 232-247. 4 fig. 1943.—At first sight, recapitulation seems much less evident among plants than among animals, but the author believes this im-

pression to be erroneous. Among primitive plants, where sporophyte and gametophyte are similar, the early development of the organs are very much alike, either globular or filament-like, with a swelling at the top. Each time the plant branches, it reproduces the ontogeny of the anatomical organization of the young plant. Among higher organized



plants, dicotyledons and even conifers, the ontogeny of the anatomical development of the embryo follows the phylogeny very closely. The author formerly contested this interpretation by Chauveaud, but he no longer doubts these conclusions.—*B. P. G. Hochreutiner.*

18792. Cowles, Raymond. The thermal factor in evolution. *Jour. Ent. and Zool.* 38(4): 49-53. 1946.—The argument is advanced that, since reptiles possess no scrotum, their decline and the extinction of many spp. may have resulted from decrease in fertility of the ♂ generative cells. Evidence is presented that high temps. prevailed up to and including the Oligocene.—*C. E. Abbott.*

18793. Dengler, F. Wie kam das Leben auf die Erde? [How did life come upon earth?] *Universum* 7(7): 187-188. 1946.—A summary of the theories on the origin of life (spontaneous generation, creation, radiation pressure). Concludes that spontaneous generation by mediation of sub-microscopical entities may come nearest to the truth.—*Max Onno.*

18794. Metcalf, Z. P. (State Coll., Raleigh, N. C.) The center of origin theory. *Jour. Elisha Mitchell Sci. Soc.* 62(2): 149-175. 19 maps. 1946.—An attempt is made to correlate geographic distribution with morphological characters with special reference to the genera of the Homoptera. The theory is advanced that, in general, true phylogenetic genera are limited to a single zoogeographic region or to contiguous regions. This theory is based on the assumption that genera have centers of origin just as species do, and that in nature spread of genera would not be rapid enough ordinarily to carry them beyond the boundaries of zoogeographic regions. Lists of genera characteristic of the various zoogeographic regions are included together with genera which are believed to be invalid under the theory here proposed. Maps of the distribution of illustrative families, subfamilies and genera are included.—*Z. P. Metcalf.*

18795. Niklitschek, A. Modelle des Lebens. [Models of life.] *Universum* 1946(3): 59-61. 7 fig. 1946.—Describes expts. on liquid crystals (Traube cells, etc.), stressing their striking similarity with primitive forms of life.—*Max Onno.*

18796. Sherman, M. Karyotype evolution: A cytogenetic study of seven species and six interspecific hybrids of *Crepis*.

*Univ. California Publ. Bot.* 18(17): 369-407. 37 fig. 1946.—Previously noted morphological evidence indicates close genetic relationship between *C. kotschyana*, which has 4 pairs of chromosomes, and several 5-paired spp. *C. kotschyana* lacks the E chromosome present in all the 5-paired spp. Evidence from pairing in F<sub>1</sub> interspecific hybrids between 6 of the 5-paired spp. and *C. kotschyana* showed that 6 translocations have occurred in *C. kotschyana* or its ancestor. Three of these involved the E chromosome: a large segment of the E chromosome, perhaps an entire arm, translocated to the long arm of the C; the translocations from E to A and from E to D were smaller, and probably involved the other arm of the E chromosome. From the present study, it is concluded that the decrease in chromosome number in *C. kotschyana* was brought about by translocations which transferred the genetically active material of the E chromosome to the A, C, and D chromosomes of the ancestral *C. kotschyana* set. It is possible that these translocations took place successively in one strain of the *C. kotschyana* ancestor and that the 4-paired species was established following loss of the free centromere. Alternately, the translocations may have occurred independently in 2 separate strains of the *C. kotschyana* ancestor, followed by hybridization of the 2 complementary types and by elimination of the extra centromeres and attached duplicated material. The basic postulate of both hypotheses, i.e., a series of translocations transferring the genetic material of the E chromosome to other chromosomes of the set, has thus been shown to have occurred in nature in the evolution of the 4-paired *C. kotschyana* from a 5-paired ancestor.—*M. Sherman.*

18797. Willis, J. C. Adaptation. *Boissiera* 7: 120-132. 1943.—The author is opposed to the theory of natural selection, insofar as it means structural adaptation. He does not deny that adaptation may exist, but believes that it is only functional, and never structural. He fully accepts De Vries's discovery of mutations but he opposes those who substitute small mutations for the older idea of gradual change "for how could selection determine that these small mutations, which practically never have adaptational value, should occur at all?" The author also supports his opposition to adaptation by arguments from geographical distribution.—*B. P. G. Hochreutiner.*

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also Entries 18796, 18819, 18824, 18828, 18831, 18841, 18842, 18846, 18868, 19070, 19378, 19398, 19460, 19461, 19482, 19916, 19930, 20381, 20437, 20441, 20448, 20699, 20896, 21189, 21190, 21191)

### GENERAL

18798. Cleveland, L. R. (Harvard U., Cambridge, Mass.) The origin and evolution of meiosis. *Science* 105(2724): 287-289. 1 fig. 1947.—The evolution of meiosis from mitosis was studied in the chromosomes of protozoa from the wood-feeding roach, *Cryptocercus punctulatus*. Two processes occurring in these protozoa, namely, permanent mitotic diploidy and meiosis without gametogenesis, lie between fertilization and mitosis and are significant. In the genus *Holomastigotoides*, the haploid chromosome number is 2, but in many spp. diploids and polyploids are present and are derived from the basic 2-chromosome form. Every division of the polyploids is exactly like the first division in meiosis. The diploidy is permanent since the centrioles are not duplicated until the chromosomes have also been duplicated. In the 2d process called endomitosis, meiosis occurs without nuclear fission. The process is descr. in *Barbulanympha*, where the centrioles are so large that the mechanism which makes the chromosome reduction possible is the accelerated duplication and function of the centrioles without duplication of the chromosomes. The centrioles are duplicated betw. the 1st and 2d meiotic divisions while the chromosomes are not and the centrioles make up for the generation which was lost earlier. Sometimes the centrioles produce an achromatic figure and nuclear division occurs. The daughter nuclei fuse. This process is autogamy. Polyploidy is always relieved by meiosis in *Barbulanympha* and no degeneration results. In gametic meiosis before fertilization and in zygotic meiosis following fertilization, centrioles are duplicated without chromosome duplication and the extra generation

makes up for the one at fertilization by one of the gametes. In changing from mitosis to meiosis the centrioles gain a generation on the chromosomes, and in changing back to mitosis, they lose a generation. In the transition from mitosis to meiosis the first step is diploidy and anything which prevents the production or function of an achromatic figure can cause a change from haploidy to diploidy. *Barbulanympha* has evolved a method for changing from haploidy to diploidy and vice versa. In the next step, the loss of a generation of centrioles does not occur until after the nucleus divides. Cytoplasmic division does not occur, the nuclei fuse, the chromosomes are duplicated, and two meiotic divisions change them to haploids. In the final step the cytoplasm divides and produces gametes. *Trichonympha* goes through all the stages that the other organisms do and, in addition, produces gametes.—*H. M. Kaplan.*

### PLANT

18799. Arata, Maria. Sulla cariologia del genere *Carlina* L. [Caryology of the genus *Carlina*.] *Nuovo Gior. Bot. Ital.* 51(1/4): 39-44. 6 fig. 1944.—All the *Carlina* spp. studied had the same chrom. no. ( $2n = 20$ ); this, the author suggests, may explain the limited area of the genus (Mediterranean basin with few extensions) and the relatively small number of spp. As to the length of chromosomes, the 6 spp. studied are grouped into 2 distinct subdivisions: 1) with chromosomes longer than  $4 \mu$ —*C. gummiifera* (var. *fontanesii*), *C. acanthifolia*, *C. acaulis* (var. *alpina*), and *C. lanata*;—2) with chromosomes shorter than  $4 \mu$ —*C. vulgaris*, *C. corymbosa*. The 1st group may be defined morphologically as

macrocephalous, the 2d as microcephalous. Referring to Fiori's systematic division of the genus, it is concluded that *C. lanata* (which in fact can have heads as large as *C. acaulis* ssp. *alpina*) should be transferred from the subsect. *Mitina* to *Heteracantha* of sect. *Eucarlina*, and that the sect. *Chamaeleon*, with *C. gummifera*, is not justified by its caryogram, which is identical with that of *Eucarlina-Heteracantha*.—*Max Onno*.

18800. Castro, Duarte de. Alguns dados cariológicos para a sistematica dos generos *Echinospartum* (Spach) Rothm., *Stauracanthus* Link, *Nepa* Webb e *Ulex* L. [Some karyological data for the systematics of the genera *Echinospartum*, *Stauracanthus*, *Nepa* and *Ulex*.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 525-538. 3 maps. 1945.—New chromosome counts are *Echinospartum lusitanicum* and *E. barnadesii*,  $2n = 52$ ; *E. boissieri* and *E. horridum*,  $2n = 44$ ; *Ulex micranthus*,  $2n = 32$ . Three vars. of *U. parviflorus* show  $2n = 32$ , 64 and 96, respectively, and in *U. europaeus* var. *borealis*,  $2n = 96$ , while in *U. e. latebracteatus*  $2n = 64$ . It is suggested that *U. gallii*, with  $2n = 80$ , represents a hybrid between these 2 subspp. In the genus *Ulex* the base number is  $x = 8$ , but the lowest number in the polyploid series is tetraploid. *Echinospartum* is thought to be derived from a diploid *Genista* with  $x = 12$ . The forms and subspecies with different chromosome numbers should be raised to specific rank.—*J. L. Cartledge*.

18801. Castro, Duarte de. Nota sobre o número de cromosomas do *Colchicum lusitanum* Brot. [The chromosome number of *C. lusitanum*.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 755-757. 1 fig. 1945.—Diploid chromosome numbers from 36 to 44 and 54 have been reported for the genus. In *C. lusitanum*, counts in P.M.C. showed  $n = 51$ .—*J. L. Cartledge*.

18802. Coutinho, L. A. Novos subsídios para a cariológia do género *Vicia* L. [New contributions to the cariology of the genus *Vicia* L.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 449-455. 3 fig. 1945.—Idiograms of *V. ferruginea*, *V. ambigua*, *V. striata*, *V. canadensis*, *V. michauxii*, and *V. grandiflora* are figured. All show chromosomes identical in number and in morphology with those of *V. sativa*. Most of these spp. have been classified as closely related to *V. sativa*, of which *V. canadensis*, following the Index Kewensis, is a synonym. *V. ambigua* was placed in a different section of *Vicia* by Nyman, and no reference to the systematic position of *V. ferruginea* was found.—*J. L. Cartledge*.

18803. Deysson, G. Tumefaction des racines et mitoinhibition sous l'influence du camphre. [Tumefaction of roots and mitoinhibition under the influence of camphor.] *Compt. Rend. Acad. Sci. [Paris]* 221(19): 568-570. 1945.—Camphor exercised a "mitoclasique" action on onion roots at an opt. conc. of 0.02 to 0.03% without provoking abnormalities in cell size. At lower concs.—0.015 to 0.012%—it caused formation of subterminal enlargements morphologically resembling those obtained with colchicine; in this case, the mitoclasique action had practically disappeared. Consequently, the 2 effects on the roots are considered to have been induced by different doses of the active principle, the 2 responses being parallel but apparently independent.—*Courtesy Exp. Sta. Rec.*

18804. Fernandes, Rosette. (Inst. Bot., Coimbra, Portugal.) Sobre a cariológia de *Narcissus canariensis* (Herb.) Burb. [The cariology of *N. canariensis*.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 597-605. 1 pl., 4 fig. 1945.—The idiogram of *N. canariensis* is identical with those of the other sub-species of *N. tazetta* of the *Tazettinae* albae series studied by A. Fernandes. The 22 diploid chromosomes are of the same 7 morphological types. The maximum number of nucleoli found in root-tip cells was 4, and 4 of the chromosomes have satellites. The external morphology of the plants, obtained from Tenerife, is also described. Fixations in Navaschin-Brunn, LaCour 2BE or Flemming-Benda were followed by gentian-violet or ferric-haematoxylin staining. For counts of nucleoli, the method of Altmann or staining with safranin-light green was employed. Pollen sterility was about 75%.—*J. L. Cartledge*.

18805. Hollande, A. Ch., et G. Hollande. (Fac. Pharm., Montpellier, France.) La structure cytologique des bactéries et des Cyanophycées. [The cytological structure of bacteria and Cyanophyceae.] *Arch. Zool. Expil. et Gén.* 84(9): 375-441. 3 pl. 1946.—The cytological structure of bacteria and

Cyanophyceae is fundamentally similar to that of other plant and animal cells. Their protoplasm contains tubular structures (one in most microbes, 2 in the Cyanophyceae examined), twisted in various ways, which bear on their surface corpuscular bodies which are joined by a strand. The findings by the nuclear reaction of Feulgen-Verne are given in an exhaustive study. The organisms examined were (bacteria) a *Coccobacillus* (not identified) found on mistletoe berries, *Bacillus megatherium*, *Leptothrix buccalis*, *Cladotrix pelomyxiae*, *Bacillus coli commune*, *B. enterothrix*, *B. camplospora*, *B. collini*, *Bacillospira praeclarum*; (Cyanophyceae) *Phormidium uncinatum*, *P. retzii* and *P. tenue*, *Nostoc verrucosum*.—*A. Raignier*.

18806. Howard, H. W. (Cambridge U., Eng.) Chromosome numbers of British species of the genus *Rorippa* Scop. (part of the genus *Nasturtium* R. Br.). *Nature [London]* 159(4028): 66. 1947.—British specimens gave counts of  $2n$ : *R. sylvestris*, 48; *R. islandica*, 32; *R. amphibia*, 16; *R. austriaca*, 16; *R. erythrocaulis*, 24. Three of these differ from published counts on European specimens; spp. may include diploid and tetraploid forms. The count on *R. erythrocaulis* confirms the morphological interpretation that it is from *R. amphibia*  $\times$  *R. islandica*.—*R. Walker*.

18807. Kumar, L. S., A. Abraham, and V. Srinivasan. The cytology of *Carica papaya* Linn. *Indian Jour. Agric. Sci.* 15(5): 242-253. 1 pl., 53 fig. 1945.—Microsporogenesis was studied in 3 spp. of *Carica* and in 3 sex types of *C. papaya*. Megasporogenesis and gametogenesis are figured for one sp. The chromosome numbers were:  $n = 9$ ;  $2n = 18$ . Study of the somatic chromosomes showed no detectable differences between the chromosome complements of the sex types.—*C. H. Arndt*.

18808. Manton, I. (U. Leeds, Eng.) Polyploidy in *Polypodium vulgare*. *Nature [London]* 159(4030): 136. 1 fig. 1947.—For vars. *semilacerum* and *omnilacerum*,  $n = 37$ ; var. *cornubiense* had  $n = 74$ ; and an apparently wild specimen from Windermere had  $n =$  approx. 111. Survey of wild forms showed both tetraploids ( $n = 74$ ) and diploids, one of the latter (*P. v. serratum*) from France. The author requests living specimens from Europe and America.—*R. Walker*.

18809. Myers, W. M., and Helen D. Hill. (U. S. Region. Pas. Res. Lab., State Coll., Pa.) Distribution and nature of polyploidy in *Festuca elatior* L. *Bull. Torrey Bot. Club* 74(2): 99-111. 8 fig. 1947.—In *F. elatior*, plants of the meadow fescue type regularly had  $2n = 14$  chromosomes; plants of the tall fescue type, *F. elatior* var. *arundinacea* had  $2n = 42$ . Both types occurred in natural stands in central Pennsylvania but the diploid was considerably more common. Meiosis in the diploid was regular while in the hexaploid there were found quadrivalents and, rarely, sexivalents at diakinesis, univalents at metaphase I, laggards at anaphase I and micronuclei in the quartets. Evidence of considerable homology between chromosomes of the diploid and hexaploid races and between chromosomes of different genomes of the hexaploid was provided by the high incidence of pairing at meiosis in  $F_1$  hybrids. In controlled cross-pollinations between diploid and hexaploid types, few  $F_1$  seeds were obtained and the hybrid plants were both  $\sigma$ - and  $\rho$ -sterile.—*W. M. Myers*.

18810. Neves, J. Barros. (U. Coimbra, Portugal.) Sur l'origine de *Ranunculus dichotomiflorus* Lag. [The origin of *R. dichotomiflorus*.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 729-752. 2 pl., 20 fig. 1945.—The chromosome numbers in *R. dichotomiflorus* is detd. as  $2n = 48$ . A maximum of 6 nucleoli was found in the vegetative nuclei, and there was 19.5% of atypical pollen. The basic chromosome number in the section *Flammula* Webb. is  $x = 8$ . In *R. ophioglossifolius* the somatic chromosome number was  $2n = 16$ , including 4 with satellites. This sp. showed 23.5% atypical pollen. For *R. flammula* the somatic number was  $2n = 32$ , both in the type and in 2 vars., confirming counts by Hocquette and others. In *R. nodiflorus*, new to the flora of Portugal, found near Bragança by A. de B. Carneiro, the same chromosome number,  $2n = 32$ , was established. Comparison of the idiograms of the above spp. suggests that *R. dichotomiflorus* is an autotetraploid originating from a cross of *R. ophioglossifolius*  $\times$  *R. nodiflorus*. The geographic distribution, time of flowering, and morphological characters all permit this interpretation.—*J. L. Cartledge*.

18811. Rodrigues, J. E. de Mesquita. (U. Coimbra, Portugal.) Sobre a localização da meiose no ciclo da vida das Characeae. [The localization of meiosis in the life cycle of the Characeae.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 609-616. 1 pl., 1 fig. 1945.—The vegetative apices of the cauloids in *Chara vulgaris* var. *longibracteata*, collected at Coimbra, show 14 long, V- or J-shaped mitotic chromosomes. The same number and kinds are found in the divisions in the spermatogenous filaments. Meiosis does not, therefore, occur in the development of the reproductive organs, as was reported by Tuttle for a species of *Nitella*.—J. L. Carlledge.

18812. Santos, Aniceta Clotilde dos. Algumas contagens de cromosomas nos géneros *Genista* L. e *Cytisus* L. [Some chromosome counts in the genera *Genista* and *Cytisus*.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 519-524. 1 pl. 1945.—In *C. lusitanicus*,  $2n = 24$ ; in *C. maderensis* var. *magnifoliosus*, and *C. canariensis*, and *C. nigricans*,  $2n = 48$ . The following have  $2n = 48$  chromosomes: *Genista monosperma*, *G. tinctoria*, *G. dorycnifolia*, *G. radiata*, *G. angelica*, *G. florida*, and *G. sagittalis* from one source, while the same species from Utrecht had 46. In *G. falcata*  $2n = 36$ , and in *G. umbellata*  $2n = 42$ . Chromosome number of *C. lusitanicus* and of all the *Genista* spp. except *G. tinctoria* and *G. sagittalis* are here first reported.—J. L. Carlledge.

18813. Sullivan, B. J., and H. I. Wechsler. (Fordham U., N. Y. C.) The cytological effects of podophyllin. *Science* 105(2730): 433. 1947.—Young growing root tips of *Allium cepa* were immersed in a satd. aqueous soln. of podophyllin, and maximal results were produced in 2 hrs. Typical resting stage and prophase figures were observed in smear preps. Pronounced cytological effects were produced in late prophase, and the spindle mechanism was evidently impaired, since no orientation of the chromosomes on the metaphase plate was seen. The chromosomes were dispersed. Metaphase chromosomes were in the form of typical diplochromosomes; sister chromatids held together at the spindle attachment region, with slightly contracted arms which have become disengaged from the relational coil. There was an increase in the number of mitotic figures up to metaphase, and a decrease and then complete absence of anaphase and telophase figures. Because of its similarity to colchicine, podophyllin may prove

valuable in the role played by colchicine in cytological research.—H. M. Kaplan.

#### ANIMAL

18814. Siang-Hsu, W. (U. Washington, Seattle.) On the cytoplasmic elements in the mid-gut epithelium of the larvae of *Drosophila melanogaster* Meigen. *Jour. Morph.* 80(2): 161-189. 4 pl., 1 fig. 1947.—The cytoplasmic elements in the epithelium of the mid-gut of the larvae of *D. melanogaster* have been demonstrated with standard methods. Secretory granules were observed to originate and mature within individual Golgi bodies, and nothing was found which could be interpreted as the internum of a Golgi system. There is no visible direct connection between the secretory granules and the mitochondria, although in cells of the stomach and of the sections of the mid-gut, further posterior mitochondria do appear bigger in diameter when the cells are in an advanced secretory stage. In such cells, the mitochondria are present only in the basal half; those in the lumen region seem to have disappeared. These cells, in discharging their secretory product, act either as merocrine or holocrine glands. The behavior of the Golgi bodies and the secretory granules in the epithelial cells of the proventriculus points to a secretory function for the anterior region of the outer wall of that structure. The secretory product in the epithelial cells is discharged into the lumen through their striated border. Mitochondria in these cells are doubly polarized, while homogeneous Golgi bodies and those containing secretion form a broad belt around the centrally located nucleus.—Auth. (courtesy Wistar Bibl. Serv.).

18815. Slizynski, B. M. (U. Edinburgh, Scotland.) Production of structural changes in somatic chromosomes of *Drosophila melanogaster*. *Nature [London]* 159(4028): 66-67. 1947.—Eggs were exposed at 5-12 hrs. after laying to 400 r. X-rays or to vapor of allyl isothiocyanate. Both agents produced structural changes in chromosomes of fully grown larval salivary gland. Narrow connections between parts of the chromosomes are interpreted as deficiencies, etc., affecting only part of the bundle of chromonemata. The author found 79 such changes in chromosomes of 21 larvae treated with allyl isothiocyanate.—R. Walker.

#### GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*  
(See also Entries 18767, 18796, 18809, 18810, 18816, 18915, 18969, 18991, 19524, 19546, 19780, 19785, 19786, 19787, 19811, 19847, 19863, 19948, 20011, 20248, 20379, 20402, 20448, 20450, 20451, 20454, 20456, 20476, 20477, 20484, 20538, 20550, 20563, 20573, 20591, 20632, 20640, 20689, 20729, 20766, 20771, 20896, 21037)

#### GENERAL

18816. Eberhardt, Karl, und Karl G. Zimmer. (Kaiser-Wilhelm Inst., Berlin, Germany.) Über die Bedeutung des Zeitfaktors für die Auslösung von Mutationen durch Strahlung. [The importance of the time factor in the production of mutations by radiation.] *Fortschr. Geb. Röntgenstrahlen* 61: 176-180. 3 fig. 1940.—The rate of lethal sex-linked mutations (which, with a slight error, may be considered as gene mutation rate) caused by x-ray irradiation does not depend on the amt. of dose, while that of ray-induced chromosomal mutations does. The importance of these results for the study of the mechanism of the "release" of mutations [Mutationsauslösung] and for questions of hereditary lesions and for ray protection is discussed.—H. Simons.

18817. Lehmann, F. E. Allgemein biologische Reaktionen auf Strahlenwirkung. [General biological reactions on radiation influence.] *Radiol. Clin. [Basel]* 10: 130-146. 1941.—A review of some biological reactions to x-rays and u.-v. radiation. Mutations and chromosome deficiencies produced by x-rays, as well as their role for the theory of "quantum-hit," are considered. The suppression of mitosis by x-rays in amphibia and the viability of these tissues, devoid of mitosis, is discussed. As to the effects of x-rays a regulative and non-regulative type of biological structures may be distinguished. The mutation rate induced in *Sphaerocarpos* by u.-v. rays clearly depends on wave length, exactly corresponding to the absorption spectrum of nucleic acids.—H. Simons.

#### PLANT

18818. Dubský, V. Somatické mutace a jejich význam

v ušlechtování rostlin. [Somatic mutations and their importance in plant breeding.] *Zeměděl. Arch. [Prague]* 32: 554-563. 1941.—The author describes the history, origin, and character of somatic mutations and gives examples of their practical use in plant-breeding practice.—E. Jermoljev.

18819. Fagerlind, F. (U. Stockholm, Sweden.) Pollenkonkurrenz und Bastardierungs-schwierigkeiten in der Gattung *Rosa*. [Pollen competition and hybridization difficulties in *Rosa*.] *Svensk Bot. Tidskr.* 40(3): 284-292. 1 fig. 1946.—It is usually possible to secure hybrid zygotes from crosses of *Rosa* spp. with the same chromosome number, and these zygotes ordinarily develop into differentiated embryos. However, *Rosa* hybrids appear to be rare in nature, because the spp. flower at different times of the yr., because of geographical isolation of compatible spp., or because insect visitors are "blütentreu." Other factors are also concerned. Crosses between spp. with high chromosome numbers and spp. with low numbers fail even to effect fertilization. Further, because of competition between the species' own pollen and pollen of other *Rosa* spp., hybrid embryos usually fail to develop. Pollen antagonism is more influenced by qualitative differences in the genom constitution than by quantitative differences. When the plant which furnishes the foreign pollen has a higher chromosome number, this antagonism is very evident, the degree of pollen antagonism being only slightly influenced or not at all by the quantitative differences. Also, many hybrid embryos die long before seed maturity, especially where the pistillate parent has a lower chromosome number than the staminate parent. Hybrid seeds with embryos of normal appearance very often show great irregularities in germination. There are embryos



of this type which never germinate, and others germinate 1, 2 or 3 yrs. later than the majority of such seeds.—*H. Horn af Rantzien*.

18820. Flor, H. H. Inheritance of reaction to rust in flax. *Jour. Agric. Res.* 74(9/10): 241-262. 1947.—The inheritance of rust reaction in 20 flax vars. was studied by determining the reaction of  $F_2$  plants to selected races of *Melampsora lini*. Resistance was invariably dominant although in a few vars. not completely so. Reaction was conditioned by single factors in Ottawa 770B, Newland, Bombay, J.W.S., Pale Blue Crimped, Kenya, Williston Brown, Billings, Akmolinsk, Abyssinian, Leona, and Tammes Pale Blue; by 2 factors in Buda, Williston Golden, Bolley Golden, and Italia Roma; and by 3 factors in Morve and Rio. C.I. 438 and C.I. 416-3 were heterozygous, in some crosses resistance was conditioned by 1 and in others by 2 factors. The 20 vars. carry at least 23 different factors, 15 of which condition resistance to or immunity from N. American races of flax rust. 21 of these 23 factors lie in 3 allelomorphic or linked series; 8 in the Ottawa 770B or LL series; 7 in the Newland or MM series; and 6 in the Bombay or NN series. Bolley Golden and Morve each have a rust-conditioning factor that is inherited independently of those in the 3 series. Some crossing over and irregular segregation was obtained in hybrids between vars. having factors in the NN series, but none in hybrids between vars. with factors in either the LL or the MM series.—*H. H. Flor*.

18821. Fore, R. E., and J. D. Sather. (*Agric. Expt. Sta., Corvallis, Oregon*.) Breeding technique with hops, *Humulus lupulus*. *Wallerstein Lab. Commun.* 10(29): 17-28. 10 fig. 1947.—This paper presents some of the botanical characteristics of the hop plant of value in the breeding program and various methods and techniques developed during 14 years of breeding expts. conducted at Corvallis, Oregon. General breeding methods used to produce improved vars. are introduction, selection from existing mixed vars., and hybridization. The bagging of branches bearing ♀ flowers in the bud stage with vegetable parchment bags protected the flowers from wind-blown and insect-carried pollen when cotton plugs were placed around the stems, and the mouths of the bags were clipped tightly around the cotton. Because of the large % of flowers burning under the bags during warm weather, the bagging method was discarded in favor of an isolated yard for ♀ plants in which production of both seeded and seedless hops on the same plant was found to be possible. Pollen for use in crossing can be collected by cutting the entire ♂ inflorescence clusters, and storing them in paper bags. Successful pollinations can be made for as long as a week after the flowers are cut by placing the bag over a lateral branch bearing female flowers and shaking vigorously until the stigmas are thoroughly dusted with pollen. Satisfactory germination of hop seeds was secured by placing the seeds between moist blotters, holding them at 41°F for 2 weeks, and then germinating at alternating temps. of 59° and 86°F. Seedlings are started in the greenhouse in the fall and winter and are transferred to the field nursery in the late spring. Some abnormal plants can be discarded in the greenhouse and 1st yr. nursery trials. The best plants are selected from the 2d yr. nursery for trials in the breeding yard. Selected plants are grown to maturity, picked for yield detns., and samples are analyzed for resin content. Detailed notes are taken on disease resistance, general vigor, and growth habits and characteristics. Plants surviving these tests are increased for further trials in growers' yards in various hop producing areas, and those proving to be superior are released for commercial production.—*Auth. summ.*

18822. Gustafsson, Åke. (*Inst. Genetics, Svalöf, Sweden*.) The advantageous effect of deleterious mutations. *Hereditas* 33(4): 573-575. 1947.—Two chlorophyll mutations, arisen from the pure line Golden barley and lethal when homozygous, increase the number of spikes and kernels as well as the total kernel wt. per plant of the heterozygotes. In monohybrid condition ( $AaBB$  or  $AABb$ ) the increase is about 6-10% above the level of Golden barley. The double heterozygote ( $AaBb$ ) shows an increase with 15 to 19%. The 2 deleterious mutations add their viability-increasing effect. The dihybrid as well as the monohybrids increase the range of variation and augment the plasticity.—*Åke Gustafsson*.

18823. Hall, H. Hybrid Euphorbias. *Gard. Chron.* [London] 118(3068): 158. 1945.—Describes an apparent hybrid between *Euphorbia lophogona* and *E. splendens*.—*C. H. Connors*.

18824. Havas, L. J. Parthenocarp and accompanying hormonal syndromes induced by unrelated chemicals. *Nature* [London] 157(3993): 629-630. 1946.—A note on the author's induction of parthenocarp in cucumber by ethyl mercury phosphate and acenaphthene and in tomato by colchicine. In addition to giving evidence of induction of parthenocarp by a mercury compound chemically unrelated to substances previously shown to exhibit that property, he stresses the hormonal effects. Taken together, he believes that the findings confirm the suggestion that there is essentially a common mechanism at work, viz., a disturbance of the vertical polarity of translocation of endogenous hormones and of the hypercompensations resulting therefrom.—*Courtesy Exp. Sta. Rec.*

18825. Hull, Fred H. (*Agric. Expt. Sta., Gainesville, Fla.*) Cryptic homozygous lines. *Jour. Amer. Soc. Agron.* 39(5): 438-439. 1947.—For clarity in consideration of an earlier proposed breeding plan, an individual open-bred corn plant is viewed as the single cross of 2 "Cryptic" homozygous lines which might have produced the 2 parent gametes. Genetically, crosses of individual plants with a tester single cross are equivalent to double crosses, and the progeny of the individual plant by selfing once are equivalent to the advanced generations of a cross of two homozygous lines. Results of regression analysis of 2 additional sets of data on yield of inbred lines of corn and the  $F_1$ 's are consistent with those summarized earlier (this journal 38: 1100-1103. 1946) in supporting the hypothesis of "overdominance", and indicating that parent lines of higher yielding hybrids may themselves be less vigorous; perhaps need to be handled as cryptics in some cases.—*F. H. Hull*.

18826. Jones, Fred Reuel, and William K. Smith. Segregation of resistance to bacterial wilt in crosses involving Grimm alfalfa. *Jour. Amer. Soc. Agron.* 39(5): 423-425. 1947.—In crosses between alfalfa plants immune and susceptible to bacterial wilt [*Corynebacterium insidiosum*] the  $F_1$  generation appears to contain plants almost as susceptible and resistant as the parents. In limited tests, the level of resistance in the  $F_2$  appears correlated with that in the  $F_1$  plants selected.—*F. R. Jones*.

18827. King, J. R., and R. M. Brooks. (*U. California, Davis*.) The terminology of pollination. *Science* 105(2728): 379-380. 1947.—Pollination, defined as the transfer of pollen from an anther to a stigma, would not necessitate the designation of the relat. positions of anthers and stigmas. If considered thusly, the single term pollination would adequately describe all types. The terminology could be enlarged to distinguish between the transfer from anther to stigma in the same flower or between diff. flowers, regardless of any hereditary relationship between the flowers. On this basis, the terms self- and cross-pollination, respectively, would serve. It should also be detd. whether these diff. flowers concerned are of the same clone, strain, variety, or subsp. or sp. This would necessitate 4 major categories of pollination: (1) within an individual flower, (2) between flowers of the same plant, (3) between flowers of diff. plants of the same var. or sp., and (4) between flowers which are on plants belonging to diff. varieties or spp.—*H. M. Kaplan*.

18828. Lamm, R. (*State Hort. Res. Sta., Alnarp, Åkarp, Sweden*.) Studies on linkage relations of the  $Cy$  factors in *Pisum*. *Hereditas* 33(3): 405-419. 1947.—The length factor  $Cy_1$  is closely linked with  $St$ . The polygenic factor  $Cy_2$  is closely linked with  $Wa$  and may perhaps belong to the  $Gp$  linkage group. This must not, however, be taken for granted until actually proved. It is very likely that  $Cy_1$  is situated between  $F$  and  $St$ . If at all belonging to the  $Gp$  group,  $Cy_2$  is probably situated in the neighborhood of  $Fs$ .  $F$  and  $Fs$  are polygenic factors. A duplication with segments containing, respectively,  $F$   $Cy_1$  and  $Fs$   $Cy_2$  would then most probably exist.—*R. Lamm*.

18829. Lebedeff, G. A. (*Agric. Expt. Sta., Experiment, Ga.*) Studies on the inheritance of hard seeds in beans. *Jour. Agric. Res.* 74(7/8): 205-215. 1947.—Five selections of beans (*Phaseolus vulgaris*) which exhibited marked differences under certain environmental conditions in the rates of softening of hard seeds were intercrossed. The plants of

these selections, as well as  $F_1$  and  $F_2$  plants from crosses, were grown in a single environment. After harvesting, the seeds were dried to about 6.61% of moisture content, and then were put to germinate. Seed softening in  $F_1$  from most of the crosses either approached closely that of the fast-softening parent or was intermediate between that of the 2 parental selections. In the  $F_2$  seed, softening ranged between that found in the parental selections, often with practically all possible degrees of variation between these 2 extremes represented. However, seed of the  $F_1$  crosses involving selection 1130 were extremely slow in softening. The  $F_2$  seed exceeded in both rapidity and slowness the rates of softening in the 2 contrasting parental selections; i.e., some softened faster than the fast-softening parent, and others softened more slowly than the slow-softening parent, the majority softening at variously intermediate rates. In the progenies other than those of the 1130 crosses, the parental extremes were not exceeded but were usually recovered. Since  $F_2$  populations were small, only a few genes appear to be involved in a given cross.—G. A. Lebedeff.

18830. Nichols, R. F. W. Breeding cassava for virus resistance. *East African Agric. Jour.* 12(3): 184-194. 1947.—An account is given of the materials and methods being used to improve cassava (*Manihot utilissima*) by selection and hybridization for resistance to mosaic and brown streak virus diseases. The first stage is the production of seed of both cassava and inter-specific hybrids by controlled pollination and multiplication of the seedlings by vegetative propagation, followed by preliminary and replicated field trials for disease resistance and cropping qualities. A method is described of classifying clones on the basis of their resistance to natural infection as reflected by statistical analyses of the results. Successful inter-specific hybridization between cassava and "tree" cassava was obtained. Backcrossing to cassava was successful and a 3d generation has been reached by this means.—T. M. McCalla.

18831. Nordenskiöld, Hedda. (Roy. Agric. Coll., Upsala, Sweden.) Cyto-genetic studies in the genus *Phleum*. *Acta Agric. Suecana* 1(1): 1-138. 1945.—The investigation is an attempt to elucidate the origin of the hexaploid *P. pratense* ( $2n = 42$ ) and its relationships to the closely allied spp. *P. nodosum* ( $2n = 14$ ), *P. alpinum* ( $2n = 14$ ) and *P. commutatum* ( $2n = 28$ ). The 4 spp. could all be crossed with one another, provided the gametes had approx. the same chromosome numbers. The chromosome pairing in the 4 spp. showed generally regular bivalent pairing, and in the hybrids, when the number of genomes is even, mainly bivalents are formed, but when it is odd, univalents and multivalents are formed. The facts show that the cultivated *P. pratense* is very closely related to *P. nodosum*, and that it must be regarded as an autopolyploid. *P. commutatum* is more differentiated from *P. pratense* than *P. alpinum*, and is regarded as an allopolyploid. Also the morphological relationships agree with these cytogenetical data. The coenospecies, ecospecies and ecotypes of the 4 *Phleum* spp. are also discussed.—S. B. Rasmuson.

18832. Peklo, J. (Sch. Agric. and Forestry, Praha, Czechoslovakia.) Přehled nových poznatků o šlechtění pšenice proti rzivosti. [A review of the recent advances in wheat breeding against yellow rust.] *Zeměděl. Arch. [Prague]* 33: 444-458. 1942.—Recent advances in plant breeding, especially in breeding vars. of wheat resistant to yellow rust (*Puccinia glumarum*), are discussed.—E. Jermoljev.

18833. Peklo, J. (Sch. Agric. and Forestry, Praha, Czechoslovakia.) Šlechtění pšenice proti žluté rzi. [The breeding of wheat against yellow rust.] *Zeměděl. Arch. [Prague]* 33: 503-522. 1942.—The author attempted to breed a wheat hybrid resistant to yellow rust and with good baking quality.—E. Jermoljev.

18834. Poehlman, J. M. (U. Missouri, Columbia.) Sources of resistance to loose smut, *Ustilago nuda*, in winter barleys. *Jour. Amer. Soc. Agron.* 39(5): 430-437. 1947.—The response of 65 winter barleys to artificial inoculation with composite collections of *U. nuda* during a 4-yr. period is reported. These include most of the winter vars. grown commercially in the U. S. and a few exptl. selections. Two of 42 rough- and smooth-awned selections were resistant, but these were tested in only 2 of the 4 yrs. 17 hooded vars. and selections were resistant out of 23 that were tested. All of the resistant hooded selections originated from one of the

Tennessee Beardless vars. or from Missouri Early Beardless.—J. M. Poehlman.

18835. Richey, F. D. (Agric. Expt. Sta., Knoxville 16, Tenn.) Corn breeding: Gamete selection, the Oenothera method, and related miscellany. *Jour. Amer. Soc. Agron.* 39(5): 403-411. 1 fig. 1947.—Gametic and zygotic frequencies, early testing and other miscellaneous facts and theories are discussed in their bearing on the value of the suggested gamete selection and Oenothera methods of corn breeding. It is concluded (1) that a direct doubling of gametes may achieve homozygosis too rapidly to be of value; (2) that no convincing evidence exists as yet that early testing of selected gametes for combining power is importantly worthwhile; but (3) that the use of selected gametes from adapted vars. for improving good but unadapted inbreds has much promise under some conditions.—F. D. Richey.

18836. Schreiner, Ernest J. (U. S. Forest Serv., Laurel, Md.) Tree breeding for desirable qualities and disease resistance. *Nation. Shade Tree Conf. [U. S. A.] Proc. and Ann. Meet.* 22: 56-59. 1946.—The plant breeder is concerned with the variation: (1) between spp.; (2) between vars. or races of the same species; (3) between individuals of the same species, var. or race. Up to now the tree breeder has obtained the most spectacular results from hybridization between tree spp. The hybrids have shown hybrid vigor, increased hardiness, and resistance to disease. Racial variation is now recognized in most tree spp. Racial hybridization offers excellent possibilities for the creation of improved tree types. The plant breeder is essentially a compounder trying to combine desirable characteristics in a single improved type. We need better shade and ornamental trees that can thrive in the difficult planting sites of our cities. This means selection and breeding for improvement of physiological characteristics. Fast growing, long-lived spp. and trees resistant to disease could be developed.—Karl Dressel.

18837. Smith, Luther. (State Coll. Washington, Pullman.) A simplified method for establishing the three-point order of genes from  $F_2$  data. *Jour. Amer. Soc. Agron.* 39(5): 353-355. 1947.—There are 3 possible orders in which 3 genes may lie in a chromosome. If they are fairly closely linked,  $F_2$  progenies of plants heterozygous for all 3 genes will be composed almost entirely of individuals that received (1) both parental, noncrossover chromosomes, (2) one chromosome with a crossover in one of the 2 intervals between the genes, and a noncrossover chromosome. The information derived from determining the genotypes of plants resulting from crossovers in the 2 intervals in (2) can be used to establish the most probable order of the genes. The chief feature of the method is in the way the data are used. However, in many cases it is sufficient and more efficient to harvest only  $F_2$  plants with certain recessive phenotypes to test in  $F_2$ . E.g., in determining the order of genes for 1 mature-plant and 2 seedling characters, it is expeditious to harvest  $F_2$  plants with the recessive mature plant character and determine the genotypes of these plants for the other 2 genes by  $F_2$  seedling progeny tests. This procedure avoids the necessity of growing large numbers of plants to maturity. The purpose of developing the method was to reduce the time, space, and effort required in establishing the orders of genes.—L. Smith.

18838. Stoker, G. L. Production and distribution of foundation seed stocks. *Farm and Home Sci.* 7(2): 20. 1 fig. 1946.—Foundation seed stocks produced by the Utah Station and released through the Utah Crop Improvement Association include Velvon 11, Trebi, and Winter Club barley; Uton and a new short oats not yet named; Dicklow, Early Baart, Federation and Lemhi spring wheats; Cache and Wasatch winter wheats; Bliss potatoes; and White Sweet Spanish and Yellow Sweet Spanish onions. The association also distributes seed of alfalfa and red clover from other stations.—Courtesy Exp. Sta. Rec.

18839. Wark, D. C. A method of selection within a variety of cabbage. *Jour. Australian Inst. Agric. Sci.* 12(4): 150-152. 1946.—Cabbages grown from seeds harvested from individual plants selected for type were more true to varietal type than cabbages from seeds harvested in bulk from good type plants. The strain produced from a bulk selection of good plants was only slightly better than the poorest plant of the parent strain. Selection for improved

type proved most effective when carried out in a region climatically suited to the var. being grown.—*M. S. Brown.*

18840. Anonymous. Progress being made in development of downy mildew resistant cucumbers. *S. Carolina Agric. Expt. Sta. Ann. Rept.* 1945: 134-138. 2 fig. 1945.—In 1939, two downy mildew-resistant cucumbers, Puerto Rico 37 and Chinese Long, were crossed with a commercial var. A & C. After several generations, types were selected which combined resistance and good type. In 1943, additional crosses were made between Puerto Rico 40 and 2 new vars., Cubit and Marketer. In 1945, a serious outbreak of downy mildew occurred and destroyed the vines of all commercial vars. by June, whereas most of the resistant lines grew until plowed under in Aug. The fruit type of some of the new resistant progenies approached that of Cubit and Marketer. The resistant lines produced fewer misshapen fruits in the latter part of the season than did commercial vars. due possibly to the better retention of foliage. An increase in infection in resistant lines observed during a stormy period in Sept. is attributed to injury and water soaking which may have been conducive to infection.—*Courtesy Exp. Sta. Rec.*

#### ANIMAL (EXCEPT MAN)

18841. Benazzi, M. (*U. Siena, Italy.*) Mutazione genetica in una razza di *Dugesia* (*Euplanaria*) *gonocephala* Dugès. [Genic mutation in a race of *D. (E.) gonocephala*.] *Atti R. Accad. Fisiocrit. Siena, Sez. Med.-Fis.* 13(1/6): 15-17. 1945.—Although based on incomplete data, the original observation was made that a race (Giocca) of *D. gonocephala* collected by the author in the vicinity of Sassari (Sardinia) possessed an increased number of chromosomes (usual  $2n = 16$ ), reaching as high as 32. Employing acetic-carmine, microphotography, etc., it was found that during oogenesis, synaptic linkage did not occur and at metaphase 32 rather large U- or V-shaped chromosomes resulted. Development in ♂ gave chromosome counts around 25 which correspond to those found in embryos of this race. In an attempt to interpret these findings, crosses were made between races Giocca and Viglietu ( $2n = 16$ ) yielding not only  $F_1$  but also subsequent generations with Giocca chromosome characteristics and numbers. The Giocca organisms were perfectly fecund.—*R. C. Bard.*

18842. Billingham, R. E., and P. B. Medawar. (*U. Oxford, Eng.*) The "cytogenetics" of black and white guinea pig skin. *Nature [London]* 159(4030): 115-117. 2 fig. 1947.—Black epidermis has the power to "infect" neighboring white epidermis and so blacken it. This is not replacement since claw and sole-of-foot epidermis and vaginal epithelium maintain their graft-specific growth pattern while receiving or transmitting the color influence. The agent, having entered white cells, causes a permanent heritable change. The infective agent may be a self-reproducing body (virus-like, or cytogene) normally present in the cytoplasm; or, less probably, a morphogenetic hormone which initiates the formation of cytogenes in white cells.—*R. Walker.*

18843. Cotronei, Giulio, e Teodoro Perri. I trapianti studiati in rapporto con le ibridazioni interspecifiche. Osservazioni sugli Anfibi. [Transplantations in relation to the intraspecific hybrids.] *Boll. Zool. [Turin]* 12(3/4): 127-134. 4 fig. 1941.—The primary optic vesicle transplanted from *Bufo viridis* to *B. vulgaris* and vice versa developed regularly up to the end of metamorphosis, while hybrids between these 2 spp. gave different results, the cross between *B. vulgaris* ♂ and *B. viridis* ♀ being incompatible. No parallelism exists between embryonal transplantations and intraspecific hybridizations.—*I. L. Coiffmann.*

18844. Júnior, R. B. Heritabilidade de pelagem em gado holandês. *Rev. Agric. [Piracicaba]* 21(9/10): 327-340. 1946.—A sex diff. in amt. of spotting in Holstein cattle was investigated. Analyses of means of a 6-mos.-old population (322 ♀♀ and 88 ♂♂) showed no significant diff. No important diff. in amt. of white spotting occurs as the animal grows up. Repeatability of the estimates of % of white was 0.98 by intra-class correlation. Degree of heritability was 0.92. Heritability was estimated by the regression of offspring on dam, computed on an intrasire basis and doubled. 345 pairs of data (dams plus offspring) from 4 sires were analyzed.—*F. P. Jeffrey.*

18845. Keeler, Clyde E. (*Georgia State Coll. for Women, Milledgeville.*) The effect upon ultimate body size produced

by combining certain coat-character genes in the Norway rat. *Jour. Tennessee Acad. Sci.* 22(2): 99-113. 1947.—When mutant strains of rats are compared with gray Norway controls, the presence of single gene pairs for curly, and cinnamon are found to produce statistically significant increases in body wt. Waltzer is neutral in that it has practically no effect on weight. In the cases of cinnamon and curly, the increase in wt. is accompanied by a corresponding increase in body length. In the cases of hooded, ruby-eye dilute and albino, reduction in wt. is accompanied by a corresponding decrease in body length. Waltzer is a reducer gene for length. All effects on weight and length are unaffected by sex. In strains bearing simultaneously several of the coat character genes mentioned above, the results of plus and minus effects on wt. are as follows: Ruby-eyed dilute cancels the weight increase produced by curly in both sexes; Hooded cancels the weight increase produced by curly in both sexes; Waltzer leaves unaltered the weight decrease produced by albino in both sexes. In strains bearing simultaneously several of the coat-character genes mentioned above, the results of plus and minus interactions on body length are as follows: Ruby-eyed dilute cancels the length increase produced by curly in both sexes; Hooded cancels the length increase produced by curly in both sexes; Waltzer exaggerates the length decrease produced by albino in both sexes.—*Auth. abst.*

18846. Morgan, L. V. (*California Inst. Tech., Pasadena.*) A variable phenotype associated with the fourth chromosome of *Drosophila melanogaster* and affected by heterochromatin. *Genetics* 32(2): 200-219. 1947.—A recessive "mutation" called "sparkling" arose spontaneously in the 4th chromosome of *D. melanogaster*. The phenotype is a bright rough eye which is variable among sibs but is not mosaic. The degree of sparkling is higher in XX ♀♀ than in XY ♂♂. Sparkling in a heterozygote for Cataract affects the expression of the dominant mutation Cataract. The expression of sparkling varies inversely with the temperature during development. Sparkling is progressively suppressed with addition of heterochromatin, of the sex chromosomes, to the chromosome complement. Heterochromatin of chromosome 2 has a similar effect. Sparkling is exaggerated in flies carrying but one dose, haplo-4 flies or *Dp(2;4)b*. Negative results were obtained in expts. which might have indicated a maternal effect.—*L. V. Morgan.*

18847. White, W. S. The environmental conditions affecting the genetic mechanism of wing production in the chrysanthemum aphid. *Amer. Nat.* 80(790): 245-270. 1946.—Approx. 29,000 chrysanthemum aphids (*Macrosiphum sanborni*) were reared under controlled conditions to study the effect of light, temp., wilting of the host plant, presence or absence of wings in the parents, and environment of the stock on wing production. Each of the factors tested had a noticeable influence, but weighting of their effects would assign the greatest influence to the light conditions prevailing during the expt. Second place would be given to the temp. used during the expt. The environment of the stock from which the exptl. animals were drawn is 3d in importance, followed by the presence or absence of wings in the parent aphids. The least effective of all the agents tested was the condition of the host plant, whether wilted or fresh.—*Courtesy Exp. Sta. Rec.*

#### MAN

18848. Caouette, Robert. (*Hôtel-Dieu, Quebec.*) Un cas d'hémophilie. *Laval Méd.* 12(3): 252-260. 1947.—Study of a hemophilic ♂ aged 25-yrs. Report of lab. exam. of blood and radiologic exam. A complete genealogic table for 3 generations is given with an explanation of the occurrence of hemophilia.

18849. Rundles, R. W., and H. J. Falls. (*U. Michigan, Ann Arbor.*) Hereditary (? sex-linked) anemia. *Amer. Jour. Med. Sci.* 211(6): 641-658. 1946.—A hereditary anemia was investigated in 2 families. The anemia was of hypochromic, microcytic type, with deformed red cells; splenomegaly and sometimes hepatomegaly accompanied the disease. The disease affected the ♂♂ through several generations, and appeared to be transmitted by the ♀♀, many of whom had enlarged spleens and minor red cell abnormalities. The inheritance seemed to be sex-linked, with the abnormality recessive or incompletely recessive.—*W. C. Stewart.*



## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 18837, 18924, 18955, 19108, 19120, 19214, 19217, 19253, 19356, 19410, 19464, 19517, 19525, 19549, 19556, 19557, 19931, 19948, 20084, 20193, 20837)

18850. Barnard, G. A. Significance tests for  $2 \times 2$  tables. *Biometrika* 34(1/2): 123-138. 1947.—Various types of expt. giving rise to results in the form of a  $2 \times 2$  table are discussed and a test is developed for one type. The type considered is that in which samples of  $m$  and  $n$  are drawn from 2 populations and each element classified in one of 2 categories. The hypothesis tested is that the proportions in one category are the same in both populations. In this situation there is no clear-cut ordering of the sample points. An ordering is developed on the 3 criteria of convexity, symmetry and maximum "volume" of the region of rejection.—*L. Katz.*

18851. Barnard, G. A.  $2 \times 2$  tables. A note on E. S. Pearson's paper. *Biometrika* 34(1/2): 168-169. 1947.—The note points up the areas of agreement and disagreement between the 2 papers on  $2 \times 2$  tables by Barnard and by Pearson in the same issue of *Biometrika*.—*L. Katz.*

18852. Barnard, G. A. The meaning of a significance level. *Biometrika* 34(1/2): 179-182. 1947.—In considering a significance level as a probability, it is necessary to isolate a class of events having the given probability. Some of the difficulties in this isolation and identification are pointed out in connection with a particular problem.—*L. Katz.*

18853. Bliss, C. (*Agric. Expt. Sta., New Haven, Conn.*) An experimental design for slope-ratio assays. *Ann. Math. Stat.* 17(2): 232-237. 1946.—In biological assays, where response is a simple linear function of dosage, relative potency may be expressed as the ratio of slopes. Computations described involve solution of 3 equations for the 2 slopes ( $b_1$  and  $b_2$ ) and the common intercept  $a'$ . Conditions favorable for assay include restricting the range of study to that providing linearity, equal spacing of doses, and equal number of doses for standard and test substances.—*F. M. Wadley.*

18854. Cochran, W. G. (*N. Carolina State Coll., Raleigh.*) Relative accuracy of systematic and stratified random samples for a certain class of populations. *Ann. Math. Stat.* 17(2): 164-177. 1946.—Comparison is made of random, stratified random (one element per stratum) and systematic samples where serial correlation exists. Stratified random samples are at least as accurate as random samples. The comparison of systematic and random samples depends on the form of the population. No unbiased estimate of error can be made from a single systematic sample, nor from a stratified random sample with only one element per stratum.—*F. M. Wadley.*

18855. Elfving, G. The asymptotical distribution of range in samples from a normal population. *Biometrika* 34(1/2): 111-119. 1947.—The distribution function of a simple transformation of the range of a sample from a normal population is expressible, in the limit, in terms of the first order Bessel function. An upper limit for differences between the distribution functions for finite samples and the limiting case is given.—*L. Katz.*

18856. Garwood, F. The variance of the overlap of geometrical figures with reference to a bombing problem. *Biometrika* 34(1/2): 1-17. 1947.—The general problem in the mathematical study of bombing consists of estimating the overall effect on a given objective. The problem is further restricted to calculation of the mean and variance of the portion of the objective area covered by destruction areas dropped in random fashion on a section of a plane including the objective area in its interior. For the areas considered (rectangles and circles), calculation of the mean presents no great difficulty. Methods, due to H. E. Robbins and to J. Bronowski and J. Neyman, are presented for calculating the variances. For the special case of the variance of the fraction of a fixed square covered by  $k$  circles, an empirical formula is given and shown to be in reasonable agreement with the exact values.—*L. Katz.*

18857. Geary, R. C. The frequency distribution of  $\sqrt{b}$  for samples of all sizes drawn at random from a normal population. *Biometrika* 34(1/2): 68-97. 1947.—A general

integral relation is established between the frequency functions of  $\sqrt{b_1}$ , or  $\alpha_3$ , in samples of size  $n$  and  $(n-1)$  from a normal population. Using the known distribution for samples of size 3 given by Fisher and iterative methods, it is possible to obtain solutions to any desired degree of precision for the frequency functions for samples of 4, 5, 6, 7 and 8. At  $n=8$ , it is shown that the frequency distribution is closely approximated by the Gram-Charlier series with the known moments up to  $\mu_3$ . Thus, for  $n \geq 8$ , empirical solutions accurate enough for practical purposes may be found by the Gram-Charlier curve.—*L. Katz.*

18859. Goulden, C. H., and Allan E. Paull. Statistical methods in cereal chemistry. *Biometrics Bull.* 2(2): 26. 1946.—Cereal chemistry is essentially a biological science, and as such, the possible applications of statistical methods are numerous. The efficient use of statistical methods ensures that all of the relevant information is extracted from the data. Furthermore, one group of data may contain more useful information than another group which requires equal or more time and effort to obtain. For this reason, an investigation should be approached statistically at the very outset—when the expt. is being designed. A problem often encountered in cereal chemistry is the differentiation of vars. of field crops for quality characteristics, and for such purposes many of the techniques developed for field plot work are applicable. The analysis of variance is probably the most frequently used statistical tool in cereal chemistry research. Applications vary from simple cases such as the comparison of the mean squares for wt. per bushel, between and within grades, to complex examples involving several factors. Correlation and regression techniques are employed quite commonly in cereal chemistry problems. The technique of covariance is also proving useful. Generally, the object of this method is to divide heterogeneous correlation effects into homogeneous groups. Due to the type of material with which cereal chemists work, most correlation studies could use covariance to determine whether the results were obtained from homogeneous populations.—*Courtesy Wallerstein Lab. Commun.*

18860. Grant, Eugene L. (*Stanford U., Calif.*) Statistical quality control. 563p. McGraw-Hill Book Co.: New York, 1946.—This is a working manual. Its object is to explain simple but powerful statistical techniques that can be widely used in industry to reduce costs and improve product quality. No attempt has been made to write for the professional statistician or the mathematician. The aim has been to give just enough theory to supply practical working rules that will enable one to recognize the limitations of the methods as well as their many uses. The material is presented in 5 parts: 1) What will statistical quality control do? 2) The Shewhart control chart for variables; 3) Other Shewhart control charts; 4) A statistical approach to acceptance procedures; 5) Making statistical quality control work. Each part contains 3-6 chapters. An appendix containing 7 tables to facilitate the calculations and interpretation of the data completes the volume. Presentation is clear. Numerical examples accompany all the important control methods.—*J. W. Gowen.*

18861. Lord, E. (*Shirley Inst., Didsbury, Manchester, Eng.*) The use of range in place of standard deviation in the  $t$ -test. *Biometrika* 34(1/2): 41-67. 1947.—The  $t$ -test compares the deviation of a sample mean from the assumed population value with a root-mean-square estimate of the standard error of that difference in samples from a normal population. For routine testing of exptl. data of various types, particularly data for control of quality of manufactured products, it is desirable to have a test of this nature which requires less computation. The ratio of the observed range to the known mean range in samples from a normal population with unit standard deviation provides an easily computed estimate of the population standard deviation. While use of the range in this modified form of the  $t$ -test necessarily entails some loss in precision, the loss is small

for samples not much larger than ten items. For larger samples, it is suggested that they be broken into random sub-samples of equal smaller size and the mean range for the several sub-samples be used to estimate the standard deviation. A modified statistic is defined, using the mean range in  $m$  samples of size  $n$  to estimate the standard deviation, and tables are given of the 10%, 5%, 2%, 1%, 0.2% and 0.1% levels for  $n$  from 2 to 20 and  $m$  from 1 to 60. An appendix to the article demonstrates the independence of the mean and certain linear estimates (including the range estimate) of the standard deviation in random samples from a normal distribution. This independence had been assumed in obtaining the distribution of the modified  $t$ -statistic.—*L. Katz.*

18862. Pearson, E. S. The choice of statistical tests illustrated on the interpretation of data classed in a  $2 \times 2$  table. *Biometrika* 34(1/2): 139-167. 1947.—In an effort to end the controversy which has raged since 1941, Pearson, following Barnard, has differentiated between 3 distinct situations in which data may be classed in a  $2 \times 2$  table. The 3 situations produce tables in which (a) both margins are fixed, (b) one is fixed and (c) neither is fixed. Corresponding to the first, the appropriate test is Fisher's "exact" distribution. Corresponding to the others, Pearson suggests a compound probability consisting of the probability of the observed marginal totals multiplied by the probability as given by the "exact" distribution. In an appendix, there is given the normal approximation to the "exact" distribution.—*L. Katz.*

18863. Plackett, R. L. Limits of the ratio of mean range to standard deviation. *Biometrika* 34(1/2): 120-122. 1947.—Upper limits for the ratio of mean range to standard deviation in samples of  $n$  from any population are given by

$$n \sqrt{\frac{2}{(2n-1)!} [(2n-2)! - \{(n-1)!\}^2]}. \text{ For large } n,$$

the upper limit is approx.  $\sqrt{n + \frac{1}{2}}$ .—*L. Katz.*

18864. Sillitto, G. P. The distribution of Kendall's  $\tau$  coefficient of rank correlation in rankings containing ties. *Biometrika* 34(1/2): 36-40. 1947.—The distribution of  $\tau$  previously given by Kendall covers the situation in which neither ranking contains ties. This paper supplements Kendall's work for the case in which one (only) of the rankings contains ties. Formulae are given for the maximum score  $S$  (in Kendall's sense) and for the variance of the distribution of scores. A table is given of the probability distribution of  $S$  for up to 10 ranked pairs and all numbers of paired and triplet rankings.—*L. Katz.*

18865. Snedecor, George W., and George W. Brown. (Iowa State Coll., Ames.) Curve fitting: An art or a science? *Iowa State Coll. Jour. Sci.* 21(3): 245-250. 1947.—The

authors discuss a graphical curve fitting method used (Becker, Carter, Burks, and Kaleita: *Iowa State Coll. Jour. Sci.* 20(4): 403-413. 1946) to fit a dependent variable, plasma atabrine,  $A.P.$ , to 2 independent variables, urinary atabrine,  $A.U.$  and titratable acidity of urine,  $T.A.$  In the paper referred to above, attempts to fit the dependent variable directly were abandoned. The method adopted depended on a transformation of the variables to a new dependent variable  $F = A.U. / (T.A.) (A.P.)$ . Plotting the observations in the plane of  $A.U.$  and  $T.A.$ , the writers fitted by eye the contours  $F = \text{constant}$ , thus obtaining a graphical means of estimating  $F$  from  $A.U.$  and  $T.A.$  Calling the estimate  $F_m$ , then the estimated  $A.P.$  is  $A.U. / (T.A.) (F_m)$ . The present authors compare this graphical method with a number of least squares approaches, including a polynomial fit of  $F$  to  $A.U.$  and  $T.A.$ , and fits of  $\log F$  and of  $\log A.P.$  to  $\log A.U.$  and  $\log T.A.$  The data are fitted almost as well by the simple logarithmic fit of  $A.P.$  directly as by the original graphical method. As compared with the original graphical method, the estimation of  $A.P.$  can be done as effectively and more conveniently by the use of either of 2 simple graphical computing devices, based on logarithmic fits on  $A.U.$  alone or on  $A.U.$  and  $T.A.$ —*Authors.*

18866. Welch, B. L. The generalization of Student's problem when several different population variances are involved. *Biometrika* 34(1/2): 28-35. 1947.—A population parameter  $\eta$  is estimated by a statistic  $y$ , normally distributed about  $\eta$  with variance  $\sigma_y^2 = \sum_{i=1}^k \lambda_i \sigma_i^2$ , where the  $\sigma_i$  are positive

numbers and the  $\sigma_i^2$  are unknown variances. If independent estimates of these variances are provided by the observed data, it is possible to make probability statements about  $y$  similar to those "Student" gave for the mean of a single sample. The form of the exact solution is given and a series solution is developed. The series converges rapidly for large samples and thus may be useful in constructing tables for this situation. An approximate solution is also given, indicating that  $y$  is approximately distributed as "Student's"  $t$ . Comparison with the exact solution shows excellent agreement for large and substantial agreement for small samples.—*L. Katz.*

18867. Wishart, John. (*Sch. Agric., Cambridge.*) The cumulants of the  $z$  and of the logarithmic  $\chi^2$  and  $t$  distributions. *Biometrika* 34(1/2): 170-178. 1947.—Explicit expressions for the exact cumulants of Fisher's  $z$ -distribution are given. Cumulants for the logarithmic  $\chi^2$ -distribution are first found (the same result was published by Bartlett and Kendall in 1946) and the cumulants of  $z$  obtained by considering the  $z$ -distribution as the difference between two logarithmic  $\chi^2$ -distributions. Cumulants of the logarithmic  $t$ -distribution are obtained by specializing the  $z$ -distribution.—*L. Katz.*

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entry 19128)

### MICROSCOPY AND TECHNIQUE

18868. Albert S. (*McGill U., Montreal, Canada.*) Staining reactions with the Feulgen and dinitrophenylhydrazine reagents. *Anat. Rec.* 97(3): 410. 1947.—An abstract.

18869. Jones, Oliver P. (*U. Buffalo, N. Y.*), and Oscar W. Richards. A method of studying dry smears of blood with phase microscopy followed by staining techniques. *Anat. Rec.* 97(3): 417-418. 1947.—An abstract.

18870. Michel, Werner. [Metachromatic behavior of benzidine dyes in plant histology.] *Ber. Schweiz. bot. Ges.* 54: 19-70. 1944.—Congo red, benzoazurine, azo blue, and several other dyes of this type can be separated by means of a  $H_2O$ -amyl alcohol mixture into hydrophilic and lipophilic components. Each component shows a characteristic absorption spectrum. Cellulose membranes are colored exclusively by the hydrophilic component, lignified or cutinized membranes by the lipophilic component. The view that such metachromatic staining is due to a dye of one definite compound which produces different shades of color

in different parts of the cell is untenable. Measurement of the size of submicroscopic membrane pores by use of such dyes is not possible. The hydrophilic or lipophilic nature of certain cell-wall components may be thus detd.—*R. C. Burrell (courtesy Chem. Absts.).*

18871. Weatherford, Harold L. (*Harvard Med. Sch., Boston, Mass.*) On the staining of fat and fatty substances with azo dyes of the Sudan series in aqueous solution. *Anat. Rec.* 97(3): 408. 1947.—An abstract.

### LABORATORY APPARATUS AND TECHNIQUE

18872. Anonymous. Stroboscope. *Indust. Equip. News* 14(8): 53. 1 fig. 1946.—Employs a self-blocking oscillator in its power unit; provides for speed setting in 4 ranges between 10 and 800 cps. (or 600 to 48,000 rpm.). A portable assembly; weighs  $19\frac{1}{2}$  lbs. Source: Communication Measurements Lab., 124 Greenwich St., New York 6, N. Y.—*M. A. Raines.*

18873. Anonymous. Cathode ray tube. *Indust. Equip. News* 14(8): 64. 1 fig. 1946.—For equipment such as an

oscillograph. Brilliance and sensitivity are the features of this new tube, which has been developed to replace the war-developed Types 3BP and 3FP. It is suited particularly for use in equipment that is to be operated under strong ambient light conditions. Designation is Type 3JP. Source: Allen B. Du Mont Laboratories Inc., 4 Main Ave., Passaic, N. J.—*M. A. Raines.*

18874. Anonymous. Ceramic beads. *Indust. Equip. News* 14(9): 1. 1946.—A new ceramic, honeycombed with ultra-microscopic pores, is supplied in the form of beads, 4-8 mesh in uniform size, to absorb moisture from air in enclosed spaces. Source: Socony-Vacuum Oil Co., 26 Broadway, 10th floor, New York 4, N. Y.—*M. A. Raines.*

18875. Anonymous. Power supply unit. *Indust. Equip. News* 14(9): 23. 1 fig. 1946.—Delivers 180 to 360 volts dc., adjustable by a knob on the front panel. Regulation is within 1% for loads to 75 ma. and line-voltage variation of 10%. Noise and hum are not more than 0.005 volt. The unit also supplies 6.3 volts ac. with center-tapped connection for filament heating. Separate switches, pilot lights and fuses are provided for the 2 outputs. Source: Hewlett Packard Co., 483 Page Mill Road, Palo Alto, Calif.—*M. A. Raines.*

18876. Anonymous. Electronic meter. *Indust. Equip. News* 14(9): 74. 1 fig. 1946.—Reads frequency of ac. voltages over the audible frequency spectrum, to 20,000 cps. It functions as a tachometer in connection with a photo-beam converter. Sounds detected by a microphone or phonograph pickup can be checked for frequency or pitch. Source: Communication Measurements Laboratory, 124 Greenwich St., New York 6, N. Y.—*M. A. Raines.*

18877. Anonymous. Temperature testing unit. *Indust. Equip. News* 14(9): 109. 1 fig. 1946.—Instrument is based on a 6-in. microammeter with selector switches and internal circuits for use as a resistance thermometer with a range of -100 to +80°F in 4 steps; as a pyrometer for temps. of 0 to 600°F in 2 steps, and as a voltmeter for 0 to 300 volts ac. It was developed originally to test temperature performance of appliances such as refrigerators and ranges; now is offered to measure temp. inside equipment under operating conditions. Source: J-B-T Instruments, Inc., 439 Chapel St., New Haven, Conn.—*M. A. Raines.*

#### PHOTOGRAPHY

18878. Clark, Walter. Photography by infrared. 2nd

ed. 472p. Illus. John Wiley and Sons, Inc.: New York, N. Y. 102 fig. 1946. Pr. \$6.—Cf. *B. A.* 13: 10678. New material adds about 20% fairly evenly throughout the book. A new chapter on detecting camouflage with infrared is included and the chapter on photographic measurement of IR has been omitted, although the material is available in other chapters. A new section discusses aerial forest surveying by IR. Bibliographic references are up-to-date. New information is included under the following: criminology, characteristics of paints and pigments with reference to the examination of paintings, medical IR photography, photomicrography, plant leaves, aerial photography and photography of temp. gradients and hot objects. Fewer figures are included, many of them are smaller and the 2d edition is smaller and, despite more pages, more compact. The fundamental information on materials, sources of IR and procedures is available and should be of use to the general photographer and the student of radiation as well as to the IR specialists.—*O. W. Richards.*

18879. Graber, T. M. (*Northwestern U. Dental Sch., Chicago, Ill.*) The theory and application of stereoscopy to patient photography. *Jour. Biol. Photogr. Assoc.* 15(3): 131-141. 6 fig. 1945.—Discrepancies not discernible in conventional pictures show clearly in stereos. The history of stereoscopy is briefly covered. Cameras and mounting of the photographs are discussed with practical applications.—*O. W. Richards.*

18880. La Rue, Mervin W., and Richard W. Kleidon. (159 E. Chicago Ave., Chicago, Ill.) Let's make a movie. *Jour. Biol. Photogr. Assoc.* 15(3): 143-157. 1945.—What to and what not to do are discussed under: accent on purpose, prepn. of script, sound films, application of film program, and producer's problems. Comment is included on how to use films in effective teaching.—*O. W. Richards.*

18881. Royer, G. L., and C. Maresh. (*Amer Cyanamid Co., Bound Brook, N. J.*) Photography of fluorescent phenomena. *Jour. Biol. Photogr. Assoc.* 15(3): 107-119. 4 fig. 1945.—Methods are given for both macro- and photomicrographic photography. Mercury arcs provided the u.-v. and various filters are described. Exposure measurement for both black and white and color is discussed. The principle application was for textiles, although other possibilities include minerals, paints, pharmaceuticals, dyes, biological and medical materials.—*O. W. Richards.*



## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries Blood chemistry of normal adult males, 19197; Sickie-cell anaemia in W. Africa, 19845; Dental pathology, 19899)

18882. Childe, V. Gordon. (*U. London, Eng.*) *Archaeology and anthropology. Southwestern Jour. Anthropol.* 2(3): 243-251. 1946.—As complementary depts. of the science of man these 2 sciences agree in classifying cultures, past and present. Overstress either on historical development or on spread of culture traits has led to controversies between evolutionists, diffusionists, and functionalists. We need to discover rules of culture change and to define progress in historical terms as forecast in the "stages" of Morgan and of Childe in order to anticipate the future in some degree, at least. For this purpose, cultures must be compared as wholes in historical context, a goal possible only through alliance of archaeology with ethnography reconciling functionalism, diffusionism, and evolutionism, archaeology alone cannot grasp such wholes because of incompleteness of excavated materials and yet only illiterate societies are numerous enough for reliable induction.—*J. L. Angel.*

18883. Chouké, K. S. (*U. Pennsylvania, Philadelphia.*) On the incidence of the foramen of Civinini and the porus crotaphitico-buccinatorius in American Whites and Negroes. II. Observations on 2745 additional skulls. *Amer. Jour. Phys. Anthropol.* 5(1): 79-86. 2 fig. 1947.—In this series the foramen of Civinini was present in 5.46% of 2745 skulls examined. It was found 4 times as often in all Whites as in all Negroes. In the White ♀♀, it was present only twice as often as in the Negro ♀♀. The incidence of pterygo-spinous foramen is slightly lower in the White and Negro ♂ skulls, considerably lower in the White ♀♀, but slightly higher in the Negro ♀♀ in these 2745 skulls than in 1544 previously reported skulls. The pterygo-alar foramen was present in about 6% of 2745 skulls. It was found 4 times as often in the Negroes as in the Whites of this series as compared to only twice as often in the previously reported series. The incidence of this foramen is slightly lower in the Negroes, considerably lower in the Whites of this series as compared to the 1st series of skulls. Observations on this series include the cases in which the beginning of the pterygo-spinous and that of the pterygo-alar foramen is definitely indicated. Similar observations were omitted in the 1st series. An attempt at the completion of a pterygo-spinous bar was present in 5.7% bilaterally in addition to being seen on the right and left sides of this series.—*Auth. (courtesy Wistar Bibl. Serv.).*

18884. Cipriani, L. *Missione di studio al Lago Tana. V. Ricerche antropologiche sulle genti. [Study mission at Lake Tana. V. Anthropological researches on the people.]* xii+468p. 45pl. Reale Accademia d'Italia: Rome, 1940.—Organization of the book: The following peoples are treated severally: Falasha, Hamites, Woito, Mahommedans, Amhara, as to somatoscopy, somatometry, correlations; thereafter follow the appendices: 1: Somatoscopy, somatometry, correlations among the Asmara Amhara; 2: the same for the Wollo Amhara; the Amhara considered as a whole; the group-anthropology of the following regions: Gondar, Gorgorá, Bahar Dar-Zeghyé, Zará Micael-Debra Tabor, Ifag. There are 216 statistical tables, 70 graphs, 45 plates with 180 portrait-photographs (90 indivs., both sexes, profile & full-face); bibliography.

Adapted from the author's summary: The principal cause of the most recent alterations in the Ethiopian racial complex evidently lies in the infiltrations of Negroid and Semitic types. So we may consider as the ancient basic type one that is somewhat rugged, best conserved in the women . . . everywhere in the Tana basin, but still better north and east of it: Proto-Ethiopian. . . There is also a widespread light element, of North African affinity . . . especially n. and n.-e. of Tana, among the Camantes and at Devesá and Gorgorá. . . It is otherwise not rare throughout Ethiopia. Verneau's attributing it to the Berber is unsatisfactory, for the problem implicates a far vaster portion of Africa. Its arrival in the Ethiopian high plateau goes very far back in time. Later, a northern Semitic type brought in cultural and racial elements, probably and chiefly via the Nile—to judge from the location of the type in eastern Africa; the Red Sea must have

been the less important route. Semitic elements are still in evidence when proceeding from n. to s. and from e. to w. of the Tana basin. The arrival of these 3 types is extremely ancient and occurred in that chronological order. Much later there arrived undoubtedly southern Semites, this time following almost exclusively the Red Sea. They were relatively few, and along with their hybrids they reached the high plateau. At first their effect was negligible; later they brought profound changes, particularly cultural. Slavery was one of the strongest incentives for continuing the serious anthropological phenomenon of Negritization, which certainly caused deterioration of the best strains in the population. None the less, the Tana basin shows still a fairly uniform fundament as to skin, hair, stature: frequently a skin-color #25, eye-color #3, curly hair, tall stature, moderate arm-length, long lower limbs, subdolichocephaly, a tendency to orthohypsicephaly, leptoprosopy and moderate leptorhiny; none of which is inconsistent with the diversity of ethnic provenience and regional variability.—*E. W. Count.*

18885. Congdon, E. D. (*Chicago Med. Sch., Illinois.*) Gross structure of the supra-pubic and pre-pubic subcutaneous layer in the male. *Anat. Rec.* 97(3): 326-327. 1947.—An abstract.

18886. Count, Earl W. (*Hamilton Coll., Clinton, N. Y.*) Brain and body weight in man: Their antecedents in growth and evolution. *Ann. New York Acad. Sci.* 46(10): 993-1122. 24 fig. 1947.—The objectives of the study were 1) to formulate the growth behavior between brain and body wts. in human ontogeny; 2) to find traits in common with other primates and mammalia (apes, monkeys, cattle, cats and rats); 3) to formulate analogous behaviors in comp. anat. and 4) to search for connections between ontogeny and comparative anatomy. With regard to comp. anat., the system of Dubois, Lapique, Brummelkamp, et al. and of von Bonin were analyzed and another system having a "cephalization exponent" and in which the brain and body wt. are related as  $y = ax^b - c \log x$  was presented. The studies showed that in man and other mammals the growth of brain wt. with respect to body wt. has 3 periods; a fetal period, a transitional period through infancy and a period thence to adulthood. In most of the fetal period the growth plots approx. a steep straight line. In life after infancy, it plots a very gradual straight line. The sexes do not coincide exactly at any point. In fetal life, man's line is steeper than monkey's and on par with the chimpanzee. In postinfantile life, the rise of brain wt. relative to body wt. is less in man than in monkey. The human brain during measurable fetal period does not grow much more rapidly than the monkey's. In the comp. anat. study, it was found that in the total mammalian system of parabolas, the steepest is the primate line which leads to man. When the ontogenic growth and comp. anat. lines were compared as far back as the former can be traced, a certain parallelism was seen to exist between fetus and comp. anat. The fetal line tops the comp. anatomic in such a way that a fetus of a given body size always has a heavier brain than some extant adult rel. of equal body size, who presumably is less evolved. In the primates, this preponderance is much greater than in any other line. The primate has put more material into the wt. of brain than any other mammal. The data on which these conclusions are based are given in 31 tables and 24 graphs. There are also 81 refs.—*Sister M. A. McDowell.*

18887. Dreifuss, F. (*Hadassah U. Hosp., Jerusalem, Palestine.*) An observation concerning the hands of patients with rheumatic fever. *Acta Med. Orientalia* 6(1): 12-17. 5 fig. 1947.—The author draws attention to the frequent occurrence of a special type of hand in patients with rheumatic fever and/or in their families. The hand is characterized by fine tapering fingers.—*J. Tas.*

18888. Gayton, A. H. Culture-environment integration: External references in Yokuts life. *Southwestern Jour. Anthropol.* 2(3): 252-268. 1946.—The forces which lead to integration of patterns or of whole cultures are usually seen as social, psychological, and immaterial. In defining culture

areas and human ecology, environment has been related to material culture rather than to the thematic factors of social life. The Yokuts' ceremonial cycle, social life, and trade as well as food collection were closely patterned on the cycle of the seasons. The physiographic setting led to antithesis of highland versus lowland in ceremonies and myths, peculiarities in terms for directions and for other tribes, and the appropriate earth-diver creation myth. Reverence for animals played a part in religious life and in the day-dreaming which underlay the people's emotional security. The whole environment was much more immediate than to us since the Yokuts lacked almost all of our selective cultural barrier. Analyses of culture-environment articulation in many societies may offer clues to the relative persistence of the nuclear patterns.—J. L. Angel.

18889. Greulich, William Walter. (Stanford U., Calif.), and Herbert Thoms. (*Yale U., New Haven, Conn.*) An x-ray study of the growth and development of the sacrum of girls during puberty and early adolescence. *Anat. Rec.* 97(3): 333-339. 1947.—An abstract.

18890. Haas, W. H. (*Northwestern U., Evanston, Ill.*) The Plateau Indian of South America. *Jour. Geogr. [Menasha, Wis.]* 45(6): 243-253. 1946.—A summary by one with wide experience in the region. Stresses environmental conditions, especially the high altitude and severe diurnal temperature.—S. S. Visher.

18891. Johnson, Frederick. (Edited by.) *Man in northeastern North America. Robert S. Peabody Found. Archaeol.* 3: 1-347. Illus. 1946.—This vol. offers a number of related papers: "The environment of the Northeast," (D. S. Byers); "A cultural perspective of Northeastern area archaeology" (W. C. McKern); "Cultural change and continuity in eastern U. S." (J. B. Griffin); "Archaeological manifestations and relative chronology in the Northeast" (W. A. Ritchie); "The importance of the Eskimo in Northeastern archaeology" (F. de Laguna); "Northeastern archaeology and general trends in the Northeast forest zone" (A. C. Spaulding); "Physical types of the Northeast" (W. W. Howells); "Linguistic considerations of Northeastern N. A." (C. F. and E. W. Voegelin); "Some psychological characteristics of the Northeastern Indians" (A. I. Hallowell); "The mythology of the Northern and Northeastern Algonkians in reference to Algonkian mythology as a whole" (M. W. Fisher); "The culture of the Northeastern Indian hunters: a descriptive survey" (R. Flannery); "The culture of the Northeastern Indian hunters: a reconstructive interpretation" (J. M. Cooper). Howells, after studying all available craniological data, concludes that in the N.-E. dolichos with narrow noses were earliest. Then came brachys with broad noses and square faces. They were succeeded by dolichos with broad noses and "somewhat oblong faces." Howells concludes that the "predominant dolichocephaly does not imply full racial homogeneity in the area, and that regional varieties, including brachycephals, existed well back into the prepottery culture, a matter of some centuries." Howells feels that the crania of the Red Paint culture are "possibly related to the Eskimos, but certainly not (to) those of the Beothuk."—W. M. Krogman.

18892. Kelly, Isabel. Excavations at Apatzingán, Michoacan. *Publ. Anthropol.* No. 7. 227p. Illus. Viking Fund: New York. 1947. Pr. \$3.00.—To augment knowledge of the archaeology of w. Mexico, excavating and surface collecting was conducted (late '41-early '42) in the w. 1/3 of the "tierra caliente" of Michoacan. Five sites were trenched; 3 were burial and one was a combination burial and habitation site. Except one cemetery, all of the excavated sites had mounds; some entirely artificial and others modified natural mounds. As in w. Mexico generally, ceramics form most of the data and chronology is inferred from stylistic changes in pottery. Five ceramic complexes have been recognized and their relative chronology, from earliest to youngest, inferred to be: Chumbicuaro, Delicias, Apatzingán, Tepetate, and Chila. Delicias and Apatzingán were mostly contemporaneous; Chila extended into post-Conquest times. Clay figurines, pipes, seals, and spindle whorls as well as shell ornaments,

pyrites-slate mirrors, obsidian prismatic blades and projectile points, manos and troughed metates, copper bells, tweezers, needles and beads, and paint cloisonné are dated in terms of this pottery chronology. One house floor was discovered, but was not sufficiently cleared to reveal its shape. Tentatively, Apatzingán "seems to represent an island of local cultures" which show no evidence of slow, local development, but, as in w. Mexico generally, changed in response to outside stimuli. The last 3 horizons successively show closer relationship with arch. manifestations in Colima and Jalisco. Tarascan culture, which dominated highland Michoacan, apparently did not influence Apatzingán though its influence extended into Tepalcatepec, the arch. area w. of Apatzingán. Mixteca-Puebla influence which affected much of Mexico a few centuries prior to the Conquest likewise did not reach Apatzingán and the "Q" complex is only weakly represented. Nevertheless, a no. of traits common to other cultures in Mexico occur in Apatzingán though the sources of such influence and the avenues by which they came are not apparent. Total no. of burials, many of which were in poor condition, is not indicated. Burials are unknown or poorly known except in the Delicias, Tepetate, and Chila phases; they are frequent but not exclusively in mounds. Extended burials on the back characterize pre-Chila times, but flexed, seated burials distinguish the Chila period. Funerary objects accompany the majority. Description of the skeletal material has been delayed.—R. M. Snodgrass.

18893. Lasker, Gabriel W. The effects of partial starvation on somatotype. *Anat. Rec.* 97(3): 352-353. 1947.—An abstract.

18894. Marston, A. T. Dr. L. S. B. Leakey's discovery of fossil anthropoid mandibles from the lower Miocene of Kenya. *Brit. Dental Jour.* 81(10): 316-320. 1946.—The author discusses the two fossil anthropoid mandibles from the lower Miocene of Kenya ascribed by Leakey to the genera *Proconsul* and *Xenopithecus*. It is claimed that *Proconsul* is clearly anthropoid ape, with no hominid tendencies but rather reflecting the approach to the primitive basic Primate condition.—J. G. Godwin.

18895. Mello, J. P. P. (*U. Brazil, Rio de Janeiro.*) The scalenus minimus muscle: its occurrence and morphology in Brazilian Whites and Negroes. *Anat. Rec.* 97(3): 398-399. 1947.—An abstract.

18896. Rogers, William M. (*Columbia U., N. Y. C.*) Changes in the human skull associated with muscle atrophy resulting from anterior poliomyelitis and other causes. *Anat. Rec.* 97(3): 364-365. 1947.—An abstract.

18897. Rusconi, Carlos. Cronología de los terrenos neoterciarios de la Argentina en relación con el hombre. [Chronology of the Neo-Tertiary deposits of Argentina in relation to man.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 35(2/3): 151-181. 1941.—This paper contains a table showing the probable age of the diff. geological levels from the Pliocene up to the present, according to the author; a table showing the stratigraphic equivalences of the principal levels, between the shore [el Litoral] and Córdoba; and a long table, covering 19 pages, showing the geological horizons of the Upper Tertiary and Quaternary, and the spp. which are most characteristic of them. This table has 3 columns: the name of the horizon, the list of fauna and human remains, and the corresponding industries. There is a bibliography of over 100 titles.

18898. Steiner, Paul E. Okinawa and its people. I. *Sci. Month.* 64(3): 233-241. 1947.—Okinawa is about 60 miles long, 3-8 miles wide, moderately warm, humid and stormy. It had about 460,000 people, small, dark, apparently of mixed Chinese, Japanese, and Malay race, of mixed Chinese and Japanese culture, with their own language; a kingdom 1187-1875, since then under full Japanese control; living by intensive agriculture, in patriarchal monogamous households, chiefly on sweet potatoes, rice, and beans.—H. F. Copeland.

18899. Washburn, S. L. (*Columbia U., N. Y. C.*) The relation of the temporal muscle to the form of the skull. *Anat. Rec.* 97(3): 376. 1947.—An abstract.

## ETHNOBIOLOGY

W. M. KROGMAN, *Editor*

(See also B. A. 21(7): Ethnobiology, s.-e. Utah cultures, 16368; Origin of oats as cultivated plant, 18032; and in this issue Maize of Indians of n.-e. U. S., 20448; History of the apple, 20534; Dyes for textiles, 20655; Origin of domesticated horse, 21234)

18900. Erwin, A. T. (*Agric. Expt. Sta., Ames, Iowa.*) Sweet corn not an important Indian food plant in the pre-Columbian period. *Jour. Amer. Soc. Agron.* 39(2): 117-121. 1947.—A critical study of the archeological material and of the early literature leads the author to the conclusion that sweet corn, *Zea mays* var. *rugosa*, was but little known in the pre-Columbian period, and its introduction and use as a food plant is attributed to the advent of the white man. In a survey made by the author, sweet corn was conspicuous for its absence, there being but a single ear of record, covering the numerous archeological collections in the U. S. The early literature also points to its post-Columbian development. Sweet corn, concludes the author, is poorly adapted to the rigors of Indian agriculture—it being less hardy than field corn and also more subject to insect and disease injury. The author also presents evidence to the effect that sweet corn is not an important food plant in several of the Latin American countries.—A. T. Erwin.

18901. Gándara, Guillermo. Nota acerca del xochinacaxtle o teunacaxtle. [Notes on the Mexican plant known as xochinacaxtle or teunacaxtle.] *Mem. y Rev. Acad. Nacion. Cienc. "Antonio Alzate"* 55(7/9): 213-218. 5 pl. 1942.—The flowers of *Cymbopetalum penduliflorum* were commonly used by pre-Cortes Aztecs to flavor chocolate. Early Spanish references to the plant are mentioned. Sessé and Mocino classified it as *Unona penduliflora*, and their description and figure are reproduced, as well as the incomplete description by Dunal, which was copied by De Candolle. The plant exists in Brazil and Peru, where it was described as *Uvaria brasiliensis*, and probably exists in Venezuela and

Ecuador. The petals of the flower are for sale in local markets in Guatemala. In 1910 William E. Safford published in *Science*, and other journals, botanical notes in which he claimed to have rediscovered the xochinacaxtle of the Aztecs. However, his figure, which is reproduced, shows leaves which really belong to *Guatteria rufa* Dunal. The author suggests that the xochinacaxtle ought to be cultivated in the region of Chiapas with a view to its commercial use for flavoring chocolate.

18902. Hawkes, J. G., and C. M. Driver. Origin of the first European potatoes and their reaction to length of day. *Nature [London]* 157(3992): 591. 1946.—A comment on the authors' studies in relation to a paper by van der Plank. [See following abstract.]—*Courtesy Exp. Sta. Rec.*

18903. Van der Plank, J. E. Origin of the first European potatoes and their reaction to length of day. *Nature [London]* 157(3990): 503-505. 1946.—There are 2 centers from which potatoes might have come, viz. the Chiloe region of southern Chile and the Andes at tropical latitudes. The evidence presented from various sources (9 references) is believed entirely consistent in showing that the first European potatoes were grown in short days, that they were in fact short-day vars., and that short-day vars. persisted for centuries. The Chilean vars. are generally regarded as long-day in reaction, and the evidence of photoperiodism is against the theory that European potatoes came from Chile. A brief discussion of the nomenclature is included.—*Courtesy Exp. Sta. Rec.*

18904. Witthoft, John. (U. Michigan, Ann Arbor.) An early Cherokee ethnobotanical note. *Jour. Washington Acad. Sci.* 37(3): 73-86. 1947.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, man; and: Hemoglobin levels of high school students, S. Carolina, 19234; Nutritional status of school children, Quebec, 19334; Ceylon, 19342; of aircraft workers, 19339; Malnutrition in Europe, 19353; Audiometric testing, 19540; Sickie-cell anaemia in W. Africa, 19845; Pre-frontal leucotomy—review of 1000 cases, 19859; Effect of emotion on electroencephalogram, 19861; Behavioral results of prefrontal lobotomy, 19865; Yaws in India, 20214)

## POPULATION, FERTILITY, VITAL STATISTICS

18905. Beegle, J. A., and T. L. Smith. Differential fertility in Louisiana. *Bull. Louisiana Agric. Expt. Sta.* 403. 1-44. 21 fig. 1946.—According to this study, largely an analysis of reproduction rates in 1940 based on the 16th U. S. Census, the rate of reproduction in Louisiana is still considerably above that necessary to replenish the population, but the relative importance of the basic stocks in the population is changing rapidly. In proportion to population, the farm people of the State are producing >2 children for every one borne by the city people. The State faces no greater problems than those of seeing that opportunities for healthful living, education, and the costs of rearing the oncoming generation are more equitably distributed among all its people. Contrary to popular belief, Negroes in Louisiana do not have a birth rate far above that of the white population. Farm Negroes are reproducing more rapidly than the whites who live on farms, but urban Negroes are less prolific than urban whites. The population of French-Catholic south Louisiana is multiplying far more rapidly than that of Anglo-Saxon, Protestant north Louisiana. In common with the other Southern States, Louisiana is contributing a disproportionately large share of the Nation's future population. In comparison with most of the other States the rates of reproduction of Louisiana farm and rural-nonfarm population are very high; however, the birth rate of urban people in the State compares closely with urban birth rates elsewhere in the Nation. Nevertheless, for at least 60 yrs. Louisiana's rate of reproduction has been falling steadily.—*Courtesy Exp. Sta. Rec.*

18906. Cabello G., Octavio. Omision del censo de 1940

y porcentaje de nacidos vivos que no se inscribieron en el registro civil. Comentarios al metodo seguido por la Direccion General de Estadistica para calcular la poblacion del pais en los anos post-censuales. *Rev. Chilena Hig. y Med. Prevent.* 8(1/2): 3-14. 1946.—The author calculates that 8.6% of births in Chile are not recorded. He indicates a method for calculating the population for post-census years. The present system would be improved if births were registered by date of birth rather than by the date of recording.—F. J. Brady.

18907. Cabello Gonzáles, Octavio. Influencia de la Unidad Sanitaria de Quinta Normal en la reduccion de la mortalidad infantil de la comuna. *Rev. Chilena Hig. y Med. Prevent.* 8(1/2): 15-27. 1946.—The author compares the neonatal mortality in populations under the care of a health center with that of a population not under its care and that of New York City. In the 3 yrs.' existence of the center the mortality declined to approx. that of New York City.—F. J. Brady.

18908. Hollander, Mildred Wiloughby, and Morris Steggerda. Intervals between births in families of old American and Dutch parentage. *Eugenical News* 30(4): 49-52. 1945.—An examination of the birth records of old American families of mixed Swedish, Dutch, English, and Scotch extraction reveals a median number of 30 months for the 17th century group; 25.5 months for the 18th century group; and 27 months for the 19th century group. A 2d family group of rather homogeneous Dutch extraction yielded a median birth interval of 28 months for the late 18th and 19th centuries. The differences between the figures for the 17th and 18th century groups are thought to be significant



and owing to differences in economic conditions between the 2 centuries. These birth intervals of both groups investigated agree rather closely with the 27-month average birth interval for Maya Indian and 24 month interval for Pueblo Indian women. The authors believe that the time of birth interval depends on inhibitory effect on ovulation by hormones concerned with lactation.—*S. B. Pipkin.*

18909. Jaffe, A. J. Notes on the rate of growth of the Chinese population. *Human Biol.* 19(1): 1-11. 1947.—An attempt was made to ascertain the range within which the "true" rate of growth of the Chinese population may lie. The basic data utilized were nine age distributions of samples of the Chinese population from which gross and net reproduction rates were derived. These data reveal that both the birth and death rates are exceedingly high; under peaceful conditions—i.e., with a death rate of between 30 and 40 per thousand population—the Chinese population might grow at a minimum rate of some 10% per generation. Any diminution in the death rate alone would result in exceedingly high population growth. The actual rate of growth in the past probably has largely been determined by the death rate, the population gains in favorable years being largely wiped out in the years of war, famine or other disasters.—*A. J. Jaffe.*

18910. Taylor, Griffith. (*U. Toronto, Canada.*) Future population of Canada. *Econ. Geogr.* 22(1): 67-74. 1946.—The author presents "a study in technique" of the present population and of several factors which bear on potential growth. He locates the regions of most and least present promise, and concludes that much wasted effort can be saved by such an analysis with maps.—*S. S. Visher.*

18911. Villar Salinas, J. [Tables of reproductiveness in Spanish provinces.] *Rev. Sanidad e Hig. Publ. [Madrid]* 17: 165. 1943.—The author uses the schedule of Frig and the information of population census in years 1900-1910, 1920-1930; he deduces that the Spanish population has increased its reproductive capacity from 1900 until 1910; after that until 1930, the values remained constant. In the eastern part of the country, the level is low; in the Cantabrian, Asturian and Galician provinces, it is high.—*O. Fernandez.*

18912. Wiersma, D. Geestelijke Volksgezondheid en zwakzinnigenzorg. [Mental public health and care of the feeble-minded.] *Maandschrift Kindergeneesk.* 12: 123-143. 1942/43.—In several countries the number of feeble-minded has more than doubled since 1913. Factors such as better diagnosis and the greater number of children in intellectually low families are insufficient to explain this fact. The cause lies in society itself which has changed enormously, so that intelligences that were adequate for the relatively quiet 19th century, are now inadequate for the ever increasing intensity and speed of the economic and social life of the last decades. Eradication of all the feeble-minded is in the 1st place impossible because debilitas mentis is most probably a recessive property and so a far greater group would have to be sterilized than that of the actual feeble-minded. In the 2d place it makes no sense because another group would then have the lowest intelligence and would soon become unable to maintain itself. The best thing for feeble-minded children and for society as well is to put them as soon as possible in a school with special education where they can be happy in the adjusted surroundings and can learn some manual work. Thereafter they remain under control of special officials who eventually see to suitable employment and the good use of free time.—*D. A. van Dorp.*

#### BEHAVIOR—SPEECH DISORDERS

18913. Tuthill, Curtis E. (*George Washington U., Washington, D. C.*) A quantitative study of extensional meaning with special reference to stuttering. *Speech Monogr.* 13(4): 81-98. 1946.—A standard phonograph record made by normal and stuttering individuals was played for 20 so-called stutterers, 20 clinicians or sophisticated persons in regard to stuttering, and 30 normals. Listeners were instructed to mark

the places where stuttering occurred on the record. In a 2d expt., a group of 11 experts, a group of janitors and a group of mothers of pre-school children listened. The 3d expt. consisted of a sound film run with 12 subjects distributed in the ways described before. The following results were obtained: Normal speakers indicated significantly smaller number of items as instances of stuttering than did stutterers or clinicians. Normal speakers have less variability among themselves than do clinicians or stutterers in indicating item of stuttering. Reliability was approx. equal for normal clinicians and stutterers. Of the total number of different items indicated, half were indicated by <25% of the group. The normal speakers agreed best, the clinicians next best, and the stutterers the least. The numbers of different items upon which each group agreed >75% were approx. the same. Of 219 items indicated as "stuttering", 45 occurred in the extemporaneous speech of normal speakers. Of 219 items indicated, only 39 were agreed upon by 75% or more of any one group; only 4 had >90% agreement by all 3 groups. The agreement of specialists was no greater than persons unacquainted with the field. Stutterers agreed less well than did either the normal speakers or experts. Addition of visual to auditory cues did not tend to increase the agreement materially. The findings in general demonstrated the vagueness of word-fact relations existing between the word "stuttering" and the auditory and visual phenomena to which it may be applied. A discussion of the implications of the data is included relative to the definition of stuttering as a condition.—*M. F. Palmer.*

#### ALCOHOLISM, TOBACCO, DRUG ADDICTION, ETC.

18914. Joss, Goodwin. Contribution of alcohol to accident fatalities in Hennepin County during a one-year period. *Quart. Jour. Stud. Alcohol* 7(4): 588-595. 1947.—Data are presented on 94 cases of accidental death in the year 1943. Alcohol detns. post mortem are reported for each case, with circumstances and causes of death. In 30.9% the blood alcohol conc. was 0.1-0.25%; in 7.4% it was 0.25% or higher. In these cases (38.3%) alcohol is believed to have caused or contributed to the death. In 1944 the corresponding percentage was 46, and in 1945, 37.5.—*Goodwin Joss.*

18915. Williams, Roger J. (*U. Texas, Austin.*) The etiology of alcoholism: A working hypothesis involving the interplay of hereditary and environmental factors. *Quart. Jour. Stud. Alcohol* 7(4): 567-587. 1947.—A working hypothesis of the etiology of alcoholism is presented which postulates that while cultural influences may in a sense be responsible for the development of alcoholism, they probably are not able to operate in this direction unless the individual is metabolically susceptible to alcoholic craving. The hypothesis is based on the distinctiveness of the metabolic patterns of individuals in general, for which there is abundant scientific evidence, especially from recent work in the field of biochemical genetics. Variability in drug responses are extremely common because of this individuality in metabolic patterns, and the variable physiological action of alcohol is entirely in line with this and probably has a similar basis. There are numerous appetites, and some aversions, which have some biochemical basis and the development of an extreme appetite for alcohol in some individuals and not in others is in keeping with what is known about other appetites. The total amt. of physiological investigation which has been directed to the question of why certain individuals crave alcohol to excess is very small. To find the answer to this crucial question attention will have to be directed to distinctive physiologies of individual people rather than to the physiology of the hypothetical average man. The physiological differences which individual people exhibit must constitute the observational data from which the answer is to be derived. To date the physiology and biochemistry of individual differences has never been seriously studied.—*R. J. Williams.*

## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also: Stratification of mosquitoes in cages, 18951; Prairie dogs, 18961; Courtship in ring-necked pheasant, 19032; Locomotor capacity of *Ambystoma* lacking Mauthners' neuron, 19913; Use of artificial light in protecting crops from insect attack, 20828; Memory in amphibian, 21188)

18916. Eibl, I. Verhalten der Erdkröte (*Bufo bufo* L.) während der Paarungszeit. [Behavior of *Bufo* during copulation.] *Umwelt* 1(2): 68-71. 3 fig. 1947.—Observations were made on copulation and spawning in toads. As a supplementary study, observations were made on a recurrent copulation readiness in toads during the mild autumn of 1946. This paralleled an occurrence of sexual responsiveness in singing birds and flowering of fruit trees and spring flowers during the same autumn.—*Max Onno*.

18917. Frisch, K. v. Die Sprache der Bienen und ihre Bedeutung. [The language of bees and its significance.] *Neue Auslese* 2(1): 111-113. 1947.—A brief summary of the significance of bees' food dances—the "round dance" for nearer and the "tail wagging dance" for more distant food sources.—*Max Onno*.

18918. Koenig, O. Anormales Verhalten bei *Pterophyllum*. [Abnormal behavior in *Pterophyllum*.] *Umwelt* 1(2): 64-65. 1947.—When kept in aquaria, the sail-fish *Pterophyllum* displayed abnormalities in the functioning of the brood-care instinct, even devouring eggs and young fish, as do many other animals with a highly developed brood-care when transferred to an unusual or unfit environment. This change in behavior is explained 1) by abnormal environment, in this case too narrow for the elaboration of normal specific brood-care, 2) by inbreeding, and 3) by the hybrid origin of the aquarium populations (*P. eimeki* × *scalare*).—*Max Onno*.

18919. Koenig, Otto. Schlafplätze. [Sleeping places.] *Umwelt* 1(2): 81. 1947.—Observations on the persistent use of accustomed sleeping places in various birds. This is

explained by the enhancement of safety in a very familiar environment.—*Max Onno*.

18920. Koenig, Otto. Die Psyche des Menschen. [Psyche of man.] *Umwelt* 1(2): 87. 1 fig. 1947.—It is the author's opinion that it may be possible, on the basis of evident parallels in psychic behavior between man and the highest infrahuman animals, to construct a "psychological genealogical tree" of man, analogous to the morphological one.—*Max Onno*.

18921. Russell, E. S. Characteristics of instinctive behaviour as illustrated by the Scarabaeidae. *Sci. Progress* 35(137): 12-22. 1947.—The author continues the studies of Fabre and others to find the essential characteristics of instinctive behavior of the dung beetles of the genus *Scarabaeus*. Several observations are described on activities such as food getting and food storing, the providing of food for the larva, and the behavior of the larvae and nymphs. Interpreting his observations and experiments the author concludes: There is shown in the making of the ball "a fair amount of variation of the rolling and burying routine, in response to varying circumstances"; "persistence with varied effort"; and "action shows persistency till the goal is reached and then ceases". "Regarded from a biological point of view, the behavior of the scarabs is clearly directive towards goals related to the biol. ends of self-maintenance, reproduction and development." What the scarab does is "without knowledge of the biological purpose of its acts; its behavior is directive, like the morphogenetic and physiological activities of its cells, but none of these activities is purposive in the psychological sense."—*Sister Rose Angela*.





# ECOLOGY

## Editors

ORLANDO PARK, *General Animal Ecology*  
G. D. FULLER, *General Plant Ecology*  
G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*  
L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL AND ANIMAL ECOLOGY]—Value of ecology in curriculum, 18760; The teaching of ecology, 18771, 18776, 18777; Phenology, Wisconsin, 18936; Euryhalinity and stability of blood pH in fish, 19009; The oyster (*Saxostrea*), 19015; Bottom fauna production of trout stream, Colorado, 19021; Growth rates of *Mytilus* spp., 19022; Eelworm cysts in soil, 20751; Insects in stored wheat, Queensland, 20840; *Balanus*, 21018; Isopoda of Michigan, 21022; Insects, 21042; Insect synecology, 21072; Cavernicolous Carabidae, 21080; Coleoptera of Swedish pine woods, 21081; Hypogeic mealworms, 21126; Odonata of alkaline areas, 21161; Termites, 21164; Biol. of Little America, 21221; Bats in Camerouns, 21231. [PLANT ECOLOGY]—Terminology of pollination, 18827; Phenology, Wisconsin, 18936; Tree ring records of precipitation, N. Dakota, 18946; Ecology of microorganisms, 20015; *Allium vineale* in British Isles, 20428; Conifers in Britain, 20614; Water impoundment as affecting tree mortality, 20620; Vegetation of native woodland, Ireland, 20633; Climate and tree potentials, 20709)

## GENERAL

18922. Raisz, Erwin. (*Harvard U., Cambridge, Mass.*) Cartography in 1946. *Jour. Geogr. [Menasha, Wis.]* 45(9): 347-351. 1946.—An excellent report of recent progress, reprinted from *Encyclopedia Americana*. Many millions of excellent maps were printed for the armed forces and, with the end of the war, the popular interest stimulated in maps has caused a surprising continuation of publication. Excellent maps are now available of many areas for which none were available a few yrs. ago.—*S. S. Visser*.

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Leonhard Finke's "Geographie" (1795), 18782; Phenology of serpentine flora, Italy, 18965; of ecotypes of little bluestem grass, 18969; Classification of vegetation types, 18983; Terminology of subhumid, etc., regions, 18985; The Ukraine—climatic analogues in N. America, 18991; Precipitation—effectiveness in Brazil, 18994; Climate and vegetation of Mauritius, 18999; and the composition of cows' milk, 19966; and distr. of citrus, 20539; and tree potentials, 20709; Meteorological data, N. Atlantic, 19002; Weather changes in relation to eclampsia, 19517; Temp. effects on physiologic responses in mild chronic trench foot, 19608; Domestic animals in the tropics, 19941; Conifers in Britain, 20614; Relationship between climatic and forest conditions, Quebec, 20650)

18923. Aikman, J. M., and G. L. Brackett. Microclimatic differences in minimum temperature and variations in frost injury to hillculture plants. *Proc. Iowa Acad. Sci.* 51: 147-156. 1 fig. 1944.—Of the climatic factors influencing the growth and yield of fruit trees and other hillculture plants in southeastern Iowa—with the possible exception of excessive drying on southwest-facing slopes—the most important is said to be low temp. Records are presented of the occurrence of definite frost injury to grapes in microclimatic areas much later in spring and earlier in fall than seemed possible from examination of U. S. Weather Bureau records—possible because the weather stations are located in sites giving average over-all climatological records in spite of variations within small areas. Even in special studies of microclimatic areas climatological determinations may be inadequate and, in order to supplement the thermograph data, use of minimum thermometers is advised on the basis of exptl. tests. The information presented on variations in temp. between 2 seasons (1942 and 1943) indicated that seasonal variations and their effects on plant growth must be considered in a study of microclimates. The ranking of the sites on a farm on the basis of adequacy of cold air drainage, length of growing season, and other temp. values may easily be done with the use of 3-4 minimum thermometers. In measuring cold air drainage, the readings should be taken after the cold air has moved in and the cold air drainage down the slope is well established. Comparisons are made of minimum temps. during winter storm periods at 3 elevations on a south slope and at the 2 nearest Weather Bureau stations (1943-44); the results seem to indicate that evaluation of sites on a winter temp. basis for fruit trees, vines, and other woody plants by means of min. temp. readings would be advisable to prevent possible winterkilling. It would also

seem desirable to designate the elevation of the site in making recommendations on the adaptation of plants to different regions or zones.—*Courtesy Exp. Sta. Rec.*

18924. Beer, A., A. J. Drummond, and R. Fürth. Sequences of wet and dry months and the theory of probability. *Quart. Jour. Roy. Meteorol. Soc. [London]* 72(311): 74-86. 1946.—Serial values of monthly rainfall over long periods at Kew and 6 other stations in the British Isles have been analyzed. The means for each of the 12 months were formed and the sequences of wet and dry months (above and below average, respectively) investigated. It was found that a close relationship existed between  $m$ , the number of successive like months, and  $F$ , the frequency with which such a series occurred; namely  $\log F = Rm + S$ , where  $R$  and  $S$  are constants for each station. After statistical tests for the absence of correlation, a mathematical theory was advanced on the basis that the sequences were purely accidental. The probability formulae obtained explained fully the empirical relationship, giving a satisfactory representation of the observational data.—*Auth. summ.*

18925. Beer, C. G. P., and L. B. Leopold. Meteorological factors influencing air pollution in the Los Angeles area. *Trans. Amer. Geophys. Union* 28(2): 173-192. 1947.—Under certain weather conditions, the Los Angeles area suffers from air pollutions (oil smoke, etc.) which cause smarting or irritations of the eyes on a few days of the year. The smoke problem here is, naturally, not so serious as it would be in a region where coal is used as common fuel. Two climatic features are decisive for air pollution: Land and sea breeze and the variations of the persistent temp. inversion over the area in question. These 2 factors, inversion and local-wind system, were investigated thoroughly. Some graphs are of special interest as average contours of inversion base, of its vertical oscillations, of the diurnal changes of surface winds, and other representations of the local-wind system. The fundamental idea of these studies is to find out how the thickness of the layer varies through which the pollutions are distributed. With increasing thickness of the layer the conc. of pollution decreases. Such studies are a valuable contribution to the general knowledge of the exchange of air in a certain local area. The investigation shows clearly the important part played by the changing height of the inversion and by the diurnal wind structure in distributing the contaminated air. "Such studies can yield . . . estimates of the vulnerability of certain locations in the city to low visibility or smoke nuisance. These are of special interest in planning . . . zoning, ordinances. . . —*V. Conrad*.

18926. Brooks, C. E. P. Climate and the deterioration of materials. *Quart. Jour. Roy. Meteorol. Soc. [London]* 72(311): 87-97. 1946.—This is a preliminary mathematical consideration of the changes in chemical composition of physical or organic constitution of materials caused mainly by heat and moisture. The damages caused by such forces as wind, rainfall, and lightning are not considered.—*Frederick Sargent*.

18927. Brunt, D. Some factors in micro-climatology. *Quart. Jour. Roy. Meteorol. Soc. [London]* 72(312/313): 185-188. 1946.—This paper is a broad consideration of the modifying influences of type of soil and type of vegetation on the incoming solar radiation by day and the output

of heat by long wave radiation by night. The effects on temp., wind, and rainfall of a forest with thick canopy, woods permitting penetration of sunlight, and small bushes, are also briefly considered.—*Frederick Sargent.*

18928. Currie, B. W. (*U. Saskatchewan, Saskatoon, Canada.*) Water content of snow in cold climates. *Bull. Amer. Meteorol. Soc.* 28(3): 150-151. 1947.—Measurements of the specific gravity of the snow precipitated at Saskatoon, Canada, during the winters of 1944-45 and 1945-46 indicate that 0.081 is a better approximation to the correct value for cold, continental climates than 0.1 for calculating the rainfall equivalent of snowfall. That is, 12 inches of snow instead of 10 inches is equivalent to 1 inch of rain in such climates.—*Frederick Sargent.*

18929. Day, W. R., and T. R. Peace. Spring frosts with special reference to the frosts of May 1935. [*Gr. Brit.*] *Forest. Comm. Bull.* 18(2): 1-111. 41 fig. 1946.—Experiences during the 9 yrs. since the first edition of this bulletin was first published are said to confirm fully the importance of frost as a cause of disease in trees in Britain. The exotic conifers have continued to provide the more extreme examples of susceptibility among species of economic importance to forestry. It is believed that sufficient examples have been given to convince the reader that the relationship between topography, frost intensity, and damage to young trees is by no means simple. It is shown that topography, by checking or promoting the flow of cold air, plays an important role in regard to frost intensity; the degree of damage, however, often depends more on the developmental stage of the buds at the time of the frost than on the local air currents. The bud stage, in its turn, may be affected by aspect and degree of slope, thus bringing the argument back again to topography. Other factors, such as the relationship of slope to soil conditions, which in turn may affect the rate at which a young tree grows out of the frost zone, exposure to the morning sun, and shelter from the wind, must also be borne in mind. It is from the interaction of some or all of these factors that the cause of any given case of frost damage must be sought. Detailed findings and conclusions of the studies are presented. Following an introductory section, the subject matter is discussed under the temperature of the ground air zone and factors affecting it, nature of late frost injury to trees and shrubs, occurrence, distribution, and relative severity of the May frosts of 1935, stage of development of trees at the time of the frosts, damage to trees and shrubs, and silvicultural aspects of shelter against frosts. Appendixes take up the late frosts in 1935 and the weather conditions associated with them and the influence of topography on severity of frost.—*Courtesy Exp. Sta. Rec.*

18930. Ehrlich, V. Z. (100 Thayer St., N. Y. 34, N. Y.) Pulmonary tuberculosis and season of birth. *Amer. Rev. Tuberculosis* 55(2): 160-169. 1947.—A statistical analysis of the season of birth of 5,986 cases of deaths due to pulmonary tuberculosis (PT) is presented. The original data were obtained from the files of the Bur. of Tuberculosis in the Board of Health in New York City. Only cases born in the northern hemisphere, dying from uncomplicated PT, and dying between 1936 and 1942 incl. were included in the analyses. The data were distributed from Jan. 1 through Dec. 31 according to the day of birth regardless of the year of birth and studied for seasonal, monthly, and short period variations. The influence of sex and color was also studied. The study revealed that (1) there is a relationship between date of birth and the likelihood of dying from PT, (2) May shows the lowest rate of susceptibility while Aug. and Sept. show the highest, (3) spring and fall show lower rates than summer and winter, spring being the season of least susceptibility, and (4) the variations noted occur with consistency even when the group is analyzed according to sex and color. Analyses by shorter periods of the year revealed exceptions. The lowest mean daily rate of birth for those dying from PT is between about 18 and 31 Jan., in the midst of a season of high rates. Between 19 and 31 July there is another low period in the midst of a season with a high rate. The period of peak daily mean rates occurs between 22 Dec. and 4 Jan.; there is also a high rate between 1 and 20 Mar.—*Frederick Sargent.*

18931. Freire Themudo, José Carlos. Alguns elementos sobre heliotermia do solo português. [A few data on solar radiation in Portugal.] *Direc. Geral Serv. Florest. e Aquíc.*

*Pub.* 9(2): 271-303. 11 fig. 1942.—The author believes that study of solar radiation would make an important contribution to knowledge of local climates—for example, the effect of differences in exposure and slope. He has worked out values for various exposures at various seasons in no., central, and so. Portugal (42°, 40°, and 38° N). The results show that exposure has a much greater effect on the quantity of solar heat received than has latitude, within the latitudinal range in Portugal. The influence of latitude is chiefly in winter, and insignificant in summer.—*W. N. Sparhawk.*

18932. Hamilton, R. A., and J. W. Archbold. Meteorology of Nigeria and adjacent territory. *Quart. Jour. Roy. Meteorol. Soc.* [London] 71(309/310): 231-264. 1945.—This paper deals with the general meteorology of Nigeria and adjacent territory. Part I describes the air masses and prevailing winds and the characteristic weather of four weather zones. Part II describes dust haze and dust storms which occur and discusses the question of forecasting the onset and clearance of dust haze. Part III deals with instability phenomena in the form of disturbance lines and local thunderstorms; a theory of their mechanism is put forward which agrees well with observed phenomena.—*Auth. summ.*

18933. Hewson, E. W. The meteorological control of atmospheric pollution by heavy industry. *Quart. Jour. Roy. Meteorol. Soc.* [London] 71(309/310): 266-282. 1945; 72(311): 51-54. 1946.—This paper describes a method of reducing atmospheric pollution by varying the emission of the offending material with meteorol. conditions. The details of the application of this principle by the Trail plant of the Consolidated Mining and Smelting Co. of Canada, Ltd., located in southern British Columbia, are given. The problem there is to prevent damage by SO<sub>2</sub> to vegetation in the state of Washington. An investigation of the distribution of winds and SO<sub>2</sub> in the Columbia River valley near Trail shows that, during the growing season, the majority of fumigations are brought about by the differential heating of the valley sides by the sun. Measured values of atmospheric turbulence and of wind speed and direction are fundamental in the control régime prescribed by the Arbitral Tribunal set up by the governments of Canada and the U. S. The possibility of applying this principle in other situations and especially over level country is discussed.—*Auth. summ.*

18934. Kimble, G. H. T. (*McGill U., Montreal, Canada.*) Tropical land and sea breezes, especially in the East Indies. *Bull. Amer. Meteorol. Soc.* 27(3): 99-113. 1946.—A comprehensive study prepd. for the British Navy. Of appreciable ecological interest.—*S. S. Visher.*

18935. Kraus, E. Climate made by man. *Quart. Jour. Roy. Meteorol. Soc.* [London] 71(309/310): 397-412. 1945.—The paper deals with the effect of human activities on the climatic environment. The following topics are briefly discussed: climate and the naked man, climate of clothes, climate of the house, climate of towns, and climate of the cultivated countryside.—*Frederick Sargent.*

18936. Leopold, Aldo (*U. Wisconsin, Madison*), and Sara Elizabeth Jones. (*Duke U., Durham, N. Carolina.*) A phenological record for Sauk and Dane Counties, Wisconsin, 1935-1945. *Ecol. Monogr.* 17(1): 81-122. 1947.—A decade of dates of 328 seasonal events at 2 stations, 33 miles apart, were analyzed and compared with prior records. Spring events during the decade 1935-1945 were 2 weeks earlier than the same events at the same station in 1881-1885. The northern station is 3 days later in spring than the southern one, which is twice the expectation under Hopkins' law. The difference between the 2 stations is least in early spring and greatest in midsummer. Some plants show little variability in date of first bloom; they seem to be governed more by length of daylight than by current weather. White clover, the least variable plant, has a standard deviation of 2.4 days, which is only 1/3 of that prevailing in other plants during the same month. Some birds show little variability in arrival date, despite the fact that they winter in or beyond the tropics where changes in length of day are much less pronounced. The least variable birds were rose-breasted grosbeak (3.1 days) and upland plover (3.2 days), both only a third of the deviation prevailing in other contemporary migrants. Bird migration responds to changes in temperature much more quickly than the bloom of plants. In 1945 the momentum of an early warm period persisted in plants through 2 months of subsequent cold. This mo-

mentum caused early bloom in white trillium despite the fact that it was still underground during the warm period.—*Aldo Leopold.*

18937. Long, T. L. (Weather Bur. Airport Sta., Montgomery, Ala.) A comparison of snowfall catch in shielded and unshielded precipitation gages. *Bull. Amer. Meteorol. Soc.* 28(3): 151-153. 1947.—Based on a study comparing the snowfall catches at the Weather Bureau Airport Station, LaCrosse, Wis., from Feb., 1940, to April, 1941, it is concluded that the unshielded precipitation gages give an inaccurate and low record for snowfall, particularly in an area subjected to wind action. There seems to be no choice, however, when rainfall catches are similarly compared.—*Frederick Sargent.*

18938. Manley, G. Temperature trend in Lancashire, 1753-1945. *Quart. Jour. Roy. Meteorol. Soc.* [London] 72(311): 1-31. 1946.—A table of monthly mean temps. for the Lancashire plain from 1753 to the present day has been compiled by reduction from a large number of little-known early observations. It is believed that from 1781 onward the values are likely to be fairly reliable. The general trend of the mean temp. for each month agrees remarkably well with that shown to have occurred since about 1820 in Scandinavia. In general, there has been an upward trend of the mean monthly winter temperatures (e.g., the Jan. means have risen about 3°F since 1820), whereas there has been no appreciable change during the summer months. The overall rise in mean annual temp. since 1820 has been about 0.6°F.—*Author's summary with additions by F. Sargent.*

18939. Manley, G. Variations in the length of the frost-free season. *Quart. Jour. Roy. Meteorol. Soc.* [London] 72(312/313): 180-184. 1946.—The problem of exposure of the thermometer and the effect of topography, type of soil and vegetation, and near-by buildings on the measured temp. are briefly discussed, together with illustrative examples. A chart is given showing the estimated trend of av. monthly min. temp. in the English Midlands based on data from representative stations having records of 30-40 yrs. in length. The following approx. intervals between damaging frost (open-air temp. below 32°F) for different types of exposure are suggested: (a) enclosed urban site in large city, April 5-Nov. 5; (b) favorable hill slope, April 15-Nov. 1; (c) average inland low lying rural area, May 15-Oct. 1; (d) "frost-hollow" (average), June 5-Sept. 12; and (e) extensive sandy lowland, June 20-Aug. 25.—*Frederick Sargent.*

18940. Michelmore, A. P. G. A popular misconception regarding humidity and the need for closer liaison between meteorologists and ecologists. *Jour. Ecol.* 34(1): 107-110. 1947.—Observations in Africa show that the effect of evaporating bodies of water and swampy vegetation on the humidity and the general climate of the surrounding country is much smaller and more localized than is commonly believed, at least by those who are not trained meteorologists. There is a need among land biologists for a wider dissemination of knowledge of the main principles of meteorology and of ecoclimatic differences. In microclimatology the present haphazard study by biologists interested in special ecological problems should be replaced by a systematic study of the whole subject in different climates. In making humidity determinations for ecological purposes the absolute humidity, relative humidity and saturation deficiency should all be computed.—*Auth. summ.*

18941. Petersen, W. F. (St. Lukes Hosp., Chicago, Ill.) Organic variability in heart disease. *Postgrad. Med.* 1(1): 36-43. 1947.—The meteorotropism of attacks and of death from coronary artery disease in a series of clinical cases is presented and the implications are discussed.—*Frederick Sargent.*

18942. Sissenwine, N. (Off. Quartermaster Gen., Washington, D. C.) Wind power in heating arctic clothing. *Bull. Amer. Meteorol. Soc.* 28(2): 90-91. 1947.—Using wind as a source of power for electrically heated clothing and accessories has been found impractical because of the excessive length of the propeller required.—*Frederick Sargent.*

18943. Trumble, H. C. Agricultural climatology in Australia. *Jour. Australian Inst. Agric. Sci.* 11(3): 115-119. 1945.—The author reviews the recent developments of agroclimatological methods in relation to an improved understanding of the Australian environment, discussing world classifications of climate, Australia in relation to other

regions and climatic indexes developed there, evaporation from water and the soil, duration of periods relating to growth, climatic variability, and the relationship of climatic indexes to land use and production in Australia.—*Courtesy Exp. Sta. Rec.*

18944. Various Authors. Insects and weather—a discussion at a joint meeting of the Royal Entomological Society of London and the Royal Meteorological Society held on 20th June 1945. *Quart. Jour. Roy. Meteorol. Soc.* [London] 71(309/310): 221-230. 3 fig. 1945.—The following brief papers—with general discussion—are presented: Phenological Relationships of Meteorology and Entomology, by H. C. Gunton (pp. 221-222); Fluctuations in Insect Populations as Related to Weather Conditions, by C. B. Williams (p. 222); Vertical Air Currents as Agents of Insect Dispersal, by A. E. Slater (pp. 223-226); and The Organisation of Bioclimatic Research, by B. P. Uvarov (pp. 226-228).—*Courtesy Exp. Sta. Rec.*

18945. Visser, Stephen S. (Indiana U., Bloomington.) Precipitation seasons in the United States. *Geogr. Rev.* 37(1): 106-111. 1947.—Four regions of the U. S. A. have conspicuous contrasts in total precipitation. The length of the dry season and of the wet season are shown by maps, and the dates at which the dry and wet seasons normally start and become pronounced. Five maps of snowfall seasons are mapped. "Excessive" rain seasons are the subject of 5 maps, and hail storms of as many. Some consequences of the precipitation are given. These 23 maps are of ecological interest.—*S. S. Visser.*

18946. Will, G. F. Tree ring studies in North Dakota. *N. Dakota Agric. Expt. Sta. Bull.* 338. 1-24. 7 fig. 1946.—Based on a study of the number and width of annual rings shown in cross sections of old logs, timbers, fence posts, and a few old living trees, the author prepared a tree-ring chart covering a long period of years. Correlated with reliable weather records of recent yrs. this chart gave a long-time picture of precipitation in various parts of N. Dakota. The longest wet period was 39 yrs. and the longest dry period was 16 yrs. There appeared to be no definite cycles. Long periods of drought were followed by either long or short wet periods. It appeared that  $>1/2$  of all the yrs. were wet enough to discourage irrigation, making the area marginal with respect to use of irrigation. Although irrigation facilities would be desirable, they should be of a type that would not carry a large overhead expense in favorable yrs.—*Courtesy Exp. Sta. Rec.*

18947. Young, A. A. Some recent evaporation investigations. *Trans. Amer. Geophys. Union* 28(2): 279-284. 1947.—Comparisons of a new screened evaporation pan (2 ft. in diam., by 3 ft. deep, set 2.75 ft. in the ground, and covered with a  $1/4$ -inch mesh wire hardware cloth) with other pans are given. The new screened pan apparently is working very well.—*V. Coirad.*

18948. Anonymous. Collections on the history of balneology in Saratoga Springs, N. Y. *Bull. Hist. Med.* 20(4): 571-582. 1946.—There are listed the bibliographical items in the Walter S. McClellan, the General James W. Lester, and the Simon Baruch Collections dealing with the history of balneology particularly in Saratoga Springs, N. Y., but also in the other spas of America and Europe.—*Frederick Sargent.*

18949. Anonymous. Insects and weather. *Quart. Jour. Roy. Meteorol. Soc.* [London] 71(309/310): 221-230. 1945.—This paper is a report of discussions held at a joint meeting of the Royal Ent. Soc. of London and the Royal Meteorol. Soc. June 20, 1945. The following papers are reported: "Phenological relationships of meteorology and entomology" (H. C. Gunton), "Fluctuations in insect populations as related to weather conditions" (C. B. Williams), "Vertical air currents as agents of insect dispersal" (A. E. Slater), and "The organisation of bioclimatic research" (B. P. Uvarov).—*Frederick Sargent.*

18950. Anonymous. Ecology and the study of climate. *Quart. Jour. Roy. Meteorol. Soc.* [London] 72(312/313): 175-179, 188-192. 1946.—A summary and discussion of 5 papers read at a joint meeting of the British Ecol. Soc. and the Royal Meteorol. Soc. May 15, 1946, are given. The papers were "Variations in the length of the frost-free season" (G. Manley), "Local climatic effects in tree growth" (W. R. Day), "Some factors in microclimatology" (D.



Brunt), "Climate within a tropical rain forest" (P. W. Richards), and "The effects of climate on the distribution of plant diseases in the Sudan" (A. S. Boughey).—*Frederick Sargent*.

#### ANIMAL

18951. Bates, Marston. The stratification of mosquitoes in cages. *Ecology* 28(1): 80-82. 1947.—Adults of 3 spp. of diurnal forest mosquitoes (*Trichoprosopon digitatum*, *Aedes serratus*, and *Haemagogus spegazzinii*), which were confined in the same large cage in a laboratory room, were observed as to their vertical distribution. The cage, 2 meters high, was built across the end of the room 3 m. from the window. The light came from the side and was evenly distributed over the whitewashed wall of the cage. The resting specimens of both *Trichoprosopon* and *Aedes* were low on the walls, while the *Haemagogus* were near the top, a difference that corresponds to their natural vertical distribution in the forest. To determine the relation of the light gradient to the resting height of the mosquitoes, one side of the cage wall was marked at 50 cm. intervals from bottom to top, and a count was taken of the specimens resting in each of the 4 divisions. 5 counts were made at  $1/2$ -hr. intervals, 3 of them with the cage receiving light from the window only, 1 with the addition of two 200-watt electric bulbs above the cage and 1 with two 200-watt bulbs at the base of the cage. The resting orientation of the mosquitoes with respect to height above the floor remained essentially the same in the presence or absence of a light gradient, or with the light gradient reversed. From this the author infers that height orientation under these cage conditions was to the floor (or ceiling) itself, and not to an environmental gradient. Under natural conditions height orientation would be constantly controlled and modified by gradient orientations, but even so the primary basis of orientation might be the same as in this cage. In the absence of an altitude gradient (i.e., reacting to a horizontal light source) *H. spegazzinii* shows a strong positive "phototropism," while both *serratus* and *digitatum* show avoiding reactions.—*M. Bates*.

18952. Birch, L. C. (U. Adelaide, Australia.) The oxygen consumption of the small strain of *Calandra oryzae* L. and *Rhizopertha dominica* Fab. as affected by temperature and relative humidity. *Ecology* 28(1): 17-25. 4 fig. 1947.—The rate of  $O_2$  consumption of larvae and adults of *C. oryzae* and *R. dominica* was detd. by the Warburg method at 14 temps. between 12° and 48°C. Humidity and the moisture content of the wheat on which the insects were feeding had no significant effect on the rate of  $O_2$  consumption. The rate per insect increased during the development of the larva and reached a maximum at the prepupal stage, it then fell during pupation and rose again as the adult matured. In all stages of development *C. oryzae* respired more rapidly than *R. dominica*. At its opt. temp. of 29°C the max. rate of  $O_2$  consumption of *C. oryzae* was reached on the 16th day (26 mm.<sup>3</sup>/insect/hr.); that of *R. dominica* at its opt. temp. (34°C) was reached on the 20th day (7.7 mm.<sup>3</sup>/insect/hr.). The trend of the curves describing the relation of temp. and rate of  $O_2$  consumption was best described by logistic curves. The larvae and adults of *C. oryzae* respired at a max. rate at 32°C; the max. for *R. dominica* was reached at 38°C. The proportionate effect of temp. on rate of  $O_2$  consumption of *R. dominica* was the same for adults and larvae. The  $O_2$  consumption of larval *C. oryzae*, on the other hand, was accelerated to a greater extent with increased temp. compared with that of the adults.—*L. C. Birch*.

18953. Boyce, Janet Mabry. (U. California, Berkeley.) The influence of fecundity and egg mortality on the population growth of *Tribolium confusum* Duval. *Ecology* 27(4): 290-302. 3 fig. 1946.—Studies were made of the relative effect of adult crowding and egg mortality on the rate of growth of an egg population and on the population of eggs at equilibrium in cultures of *T. confusum*. The studies illustrate that a lowered fecundity rate is the major factor limiting the rate of growth of the egg population and that egg consumption, which is the only factor of importance in egg mortality, stabilizes a population at the density where the fecundity rate is such that egg mortality equals egg production.—*J. M. Boyce*.

18954. Brown, H. Leo. Why has the white-tailed jack rabbit (*Lepus townsendii campanius* Hollister) become

scarce in Kansas? *Trans. Kansas Acad. Sci.* 49(4): 455-456. 1947.—The change in distribution of the two species of jack rabbits in Kansas was gradual. The changes in environmental conditions when man began to break up the prairie and plant crops, especially wheat, seem to be the most reasonable explanation for the decrease in numbers of the white-tailed jack rabbit. The changing of the open prairie to cultivated land seemed to make conditions more favorable for the black-tailed jack rabbit to adapt itself to the new agricultural environment. This thought was reported by several of the early pioneers of western Kansas.—*Auth. summ.*

18955. Cole, Lamont C. (Indiana U., Bloomington.) A theory for analyzing contagiously distributed populations. *Ecology* 27(4): 329-341. 1946.—Under natural conditions, living organisms are usually contagiously distributed in space, i.e., contrasted to random distr., too many infertile samples and too many large groups of organisms are encountered. Contagiousness is attributable to any or all of the following factors: inappropriate sample size, sample heterogeneity, common origin of the individuals, and active aggregation. The hypothesis is advanced that many contagious distrs. may be interpreted as composed of various-sized groups of organisms with these groups distributed as units in a Poisson distr. The mean number per sample of groups containing  $x$  organisms is designated as  $m_x$  and the mean number of groups per sample as  $m_0$ . For the total frequency distr. then,  $m_0 = \sum m_x$ ,  $m = \sum x m_x$ , and  $\sigma^2 = \sum x^2 m_x$ . Tentative computational methods are developed for determining the  $m_x$  values and several empirical distrs. are fitted by this means, thus indicating the structure of a population which, under the postulated random process, would yield the observed distrs. This theory of contagious distrs., if tenable, opens many possibilities for population analysis.—*L. C. Cole*.

18956. Marshall, Nelson. (U. North Carolina, Chapel Hill.) The spring run and cave habitats of *Erimystax harperi* (Fowler). *Ecology* 28(1): 68-75. 1947.—In Florida *E. harperi* is common in small limestone sinks and caves and in the run-off streams from artesian springs. The underground water feeding the springs, and subsequently these spring runs, is probably continuous with that forming the pools in the sinks and caves. This water is characteristically clear, has a rather constant temp. just above 70°F, and a pH slightly above neutral. The dissolved  $O_2$  content recorded in cave waters and deep in the springs is attributed to low bacterial activity in underground channels. The *E. harperi* of the streams do not frequent the quiet waters about the adjacent springs. This is in contrast to the populations which prosper in caves and sinks where the water is sluggish. It is suggested that better feeding and decreased predation, as these minnows school in the current, may be important in the preference for these small runs rather than the more quiet waters of the springs that flow into them. Records indicate spawning may extend the year around where nutrition is favorable and the constant temp. is considered basic in accounting for such prolonged breeding activity.—*Nelson Marshall*.

18957. Mohr, Carl O. (Nat. Hist. Surv., Urbana, Ill.) Notes on chiggers, rats and habitats on New Guinea and Luzon. *Ecology* 28(2): 194-199. 2 fig. 1947.—Examination was made for infestation by chiggers of 40 *Rattus ringens* and 32 *R. exulans*, some caught in killer traps and some in live traps, in habitats ranging from dense jungle through grassland to newly cleared areas in western New Guinea. *Trombicula deliensis* appeared most abundant on either species of rat from the denser cover. *T. akamushi* was not observed in this area but is reported from relatively permanent grasslands and jungle margin elsewhere. *R. ringens* was caught most commonly in dense cover and *R. exulans* under light cover. Examination of 40 *R. ringens* and 40 *R. exulans* caught alive from the above habitats and some additional habitats shows that, of nine observed species of chiggers, *T. deliensis* was found on most *R. ringens* and that *W. disparunguis* was present on a substantial number. *T. deliensis* was present on a lesser but substantial number of *R. exulans*. The other seven species of chiggers were found only on an occasional rat. *T. akamushi* was taken from *Rattus mindanensis* and *Suncus luzonensis* in open dry situations in the Lingayan area on Luzon.—*C. O. Mohr*.

18958. Moore, Robert T. (*California Inst. Technol., Pasadena.*) The Transverse Volcanic biotic province of central Mexico and its relationship to adjacent provinces. *Trans. San Diego Soc. Nat. Hist.* 10(12): 219-235. Map. 1945.—Students of biotic relationships have overlooked the importance of the great volcanic area, which stretches across the southern end of the Central Plateau of Mexico, extending west to east to within 50 miles of the Pacific and Atlantic Oceans respectively. Here volcanism has reached its zenith of power and destruction. The effect of the deposition of ash, not to speak of the enormous quantity of igneous vapors constantly pouring into the atmosphere, on the mammals, birds and other creatures of the area, can hardly be exaggerated. Fortunately the region receives summer rains and the ash is fertile. The author deems this area, to which he has given the name "Transverse Volcanic," one of the major biotic provinces of Mexico. A preliminary statistical appraisal of specimens from the area would indicate that it may be the most important province of all, at least in respect to the number of endemic forms occurring within it. The author has made a survey, admittedly provisional, of all the bird forms found within the boundaries of Mexico and has completed a more careful study of those breeding within this province and the adjacent provinces on each side. By a conservative estimate it would seem that at least 80 forms are confined to the province, whereas <60 are limited to the next largest biotic province, the Yucatán Peninsula, and <50 to the 3d largest, the Veracruz. The author delimits 5 faunal districts of the Transverse Volcanic Province from an ornithological point of view. They are the Jalisco, Tarascan, Otomi, Aztec, and Orizaba-Zempoaltepec. The author then gives statistical information to prove their validity. He also gives statistics to show the relationships between the Transverse Volcanic Province and other provinces of Mexico.—O. S. Pettingill, Jr.

18959. Pearson, O. P. (*Harvard U., Cambridge, Mass.*) The rate of metabolism of some small mammals. *Ecology* 28(2): 127-145. 1947.—The rate of metabolism of 16 spp. and subsp. of small mammals was measured in an apparatus that recorded the  $O_2$  consumption at frequent intervals during runs of 24 hrs. The 24-hr. average, maximum, minimum, and "basal" values are listed and discussed for *Sorex*, *Blarina*, *Scalopus*, *Myotis*, *Eptesicus*, *Peromyscus*, *Pitymys*, *Microtus*, *Clethrionomys*, *Mus*, *Zapus*, *Napaeozapus*, and *Glaucomys*. The 2 shrews had the highest metabolism, bats the lowest. The daily metabolic cycle corresponded with the expected activity cycle of the species. Judging from the ratio metabolism at night/metabolism during the day, *Myotis*, *Eptesicus*, *Glaucomys*, and *Peromyscus* were the most nocturnal, *Clethrionomys* and *Pitymys* the least. No species was diurnal. Short metabolic cycles of 1-2 hrs. were noted in several species. Each sp. consumed  $O_2$  at a rate or in a manner characteristic of that sp.—O. P. Pearson.

18960. Robertson, O. H. (*U. Chicago.*) An ecological study of two high mountain trout lakes in the Wind River Range, Wyoming. *Ecology* 28(2): 87-112. 3 fig. 1947.—An explanation for the marked difference between the sizes of the trout inhabiting 2 small interconnecting lakes of approx. similar area, depth, and general appearance, which had been initially stocked 10 yrs. previously with the same number of cutthroat fry, constituted the subject of this investigation. A number of large trout from 15 to 22 inches long and weighing  $1\frac{1}{2}$ - $4\frac{1}{4}$  lbs. were taken from the upper of the two lakes, while the lower lake yielded only small fish averaging 9 inches in length, 3-4 ounces in wt. and exhibiting a low coeff. of condition. A study of the scales of 140 fish for age and growth showed that although there was not much difference in the life span of the trout caught in the 2 lakes, 4-5 years for the upper and 3-4 years for the lower lake, the growth of the former fish proceeded at a very much faster rate. Quantitative detn. of the lake fauna revealed a much greater supply of trout food in the upper lake. In harmony with this difference was the finding that the stomachs of the upper lake trout contained a volume of contents 3 times that of similar sized fish taken from the lower lake. Furthermore, the predominant faunal form found in the stomach (*Chironomus*) corresponded with that occurring most abundantly in the lake. These data on available food supply combined with the presence of a considerably larger fish population in the lower lake, presumably resulting from

more extensive spawning areas, would suggest that herein lies the principal reason for the differences in growth and size of the fish in the 2 lakes. In support of this inference was the lack of any significant difference in plankton counts, temp., pH,  $O_2$  content, dissolved Ca, or  $HCO_3$ . However, the finding of a greater conc. of phosphates and iodine in the water and a larger % of organic matter in the water soil of the upper lake, brings up the possibility of the influence of certain chem. constituents on lake productivity. The relationship of these findings to other studies on high mountain lakes is discussed.—O. H. Robertson.

18961. Scheffer, Theo. H. Ecological comparisons of the plains prairie-dog and the Zuni species. *Trans. Kansas Acad. Sci.* 49(4): 401-406. 4 fig. 1947.—A comparison of the habits, burrow formation, social behavior, and an account of the differences in habitat of the Zuni prairie-dog, *Cynomys gunnisoni zuniensis*, and the plains prairie-dog.—F. C. Gates.

18962. Stanley, John. (*McGill U., Montreal, Canada.*) The environmental index, a new parameter, as applied to *Tribolium*. *Ecology* 27(4): 303-314. 1946.—A study is made of the development of the flour beetle, *T. confusum*, at 17°, 22°, 27°, 28°, 29°, 31°, 32°, 33° and 35°C with percentages of survival and time required for development of the various life history stages. Relative Environmental Indices ( $E_r$ ) are calculated as  $E_r = S/T$  where  $S$  = percent survival through a life history stage and  $T$  = time required for the stage. The  $E_r$  at the opt. is equated to 1, and values of  $E_a$  (the Absolute Environmental Index) are calculated by expressing the various  $E_r$ 's as decimal fractions of  $E_o$ , the value at the optimum. Tabulations are made of the  $E$ 's for all life history stages at most of the above temps., at a rel. humidity of 75%. Some suggestions are made as to the use of these  $E$ 's in assessing the danger of an insect-infestation under a given set of environmental conditions, and methods are shown of calculating cumulative indices covering a whole life history.—J. Stanley.

18963. Williams, Louis G. (*Duke U., Durham, N. Carolina.*) A comparative size study of the mole crab, *Emerita talpoida* Say, associated with epizoid *Enteromorpha flexuosa* (Wulfen) J. Ag. *Ecology* 28(2): 204-207. 1 fig. 1947.—A marine green alga associated with a beach crab is described and reported for the first time. Measurements of carapaces of *Emerita talpoida* from 3 localities in N. Carolina showed considerable locality variation. Comparison of data revealed wide yearly fluctuation in sizes for one locality. Because of 3 well defined size classes at least some individuals of *E. talpoida* were interpreted as being biennials.—L. G. Williams.

## PLANT

18964. Barbosa, L. A. Brandvaux. Matos da Quercus coccifera nos arredores de Oeiras e Cascais. (Subsidie fitosociológico). [Stands of *Quercus coccifera* in the vicinities of Oeiras and Cascais.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 759-788. 1 pl. 1945.—Inventories of the spp. in natural communities west of Lisbon, with special reference to those in which the shrubby *Quercus coccifera* is dominant, are given, some edaphic and climatic conditions are indicated, and anthropogenic influences on the vegetation are described. The methods of phyto-sociologic description follow those used by Braun-Blanquet. Other neighboring communities are also discussed, including those with *Arbutus unedo* and *Oleaster*, on basalt, and sea-sand communities where *Juniperus phoenicia* is dominant. The *Quercus coccifera* communities belong to the order Quercetalia ilicis of Braun-Blanquet.—J. L. Carlledge.

18965. Bargoni, Ida. Osservazioni fenologiche sulle serpentine dell'Impruneta (Firenze). [Phenological observations on serpentine of Impruneta.] *Nuovo Gior. Bot. Ital.* 50(3/4): 232-251. 1943.—Phytophenological observations at 2 serpentine stations in the Province of Florence showed that the awakening of vegetation in spring is not delayed on serpentine as compared with other soils, at least for the typical spp., whereas some of the trivial spp., such as *Bromus erectus* and *Brachypodium pinnatum*, showed a marked delay on serpentine. The typical serpentine plants are characterized by a long persistence of dry above-ground organs. Dissemination is slow and often protracted until late autumn or even the following spring.—Max Onno.

18966. Burbidge, Nancy T. Notes on the vegetation of the North Eastern Goldfields. *Jour. Roy. Soc. Western Australia* 27: 119-132. 1940/1941 (1943).—Ecologically, this area is in the southern part of the *Acacia* semi-desert scrub as defined by Teakle. *Acacia aneura*, its vars. and allied spp., constitute the most important tree and shrub forms. This paper reports the spp. found in a survey of 14 ecological transects, and includes a complete list of plants collected at Glenorn Station, Malcolm, during visits in 1937 and 1938.

18967. Cavique Santos, Paulo Emílio. Subsídios para a análise botânica dos fenos de Gerez. [Botanical analysis of the hay from the Gerez pastures.] [With Eng. summ.] *Direc. Geral Serv. Florest. e Aquíc. Pub.* 9(2): 219-234. Map. 1942.—Composition of the forage vegetation of pastures in the Gerez Mts. of n. Portugal.—*W. N. Sparhawk*.

18968. Conway, Verona M. (*U. Sheffield, Eng.*) Ringinglow bog, near Sheffield. *Jour. Ecol.* 34(1): 149-181. 11 fig. 1947.—An area of deep blanket peat is desc. about 400 acres (1.6 km.<sup>2</sup>) in extent, lying about 6 miles (10 km.) south-west of Sheffield, at an altitude of about 1300 ft. (400 m.). It lies on a very gradual slope with much restricted drainage. Wood peat occurs in the lower layers at the better-drained and more sheltered end of the bog. The main mass of peat has been formed predominantly by *Sphagnum* spp. *Eriophorum vaginatum* has been a constant component of the bog vegetation, but at no time until the present day has it been a dominant. Pollen analysis shows that peat formation began throughout the area at the time of the Boreal-Atlantic Transition (ca. 6000 B.C.). Evidence is brought forward of widescale destruction of forest in the region, beginning somewhere around A.D. 1100, and continuing to a maximum depletion in the 17th century.—*Auth. summ.*

18969. Cornelius, Donald R. The effect of source of little bluestem grass seed on growth, adaptation, and use in revegetation seedings. *Jour. Agric. Res.* 74(4): 133-143. 3 fig. 1947.—Little bluestem (*Andropogon scoparius*) plants were grown at the Soil Conservation Service nursery, Manhattan, Kans., from seed obtained from 16 sources representing different ecotypes. 2 series of rod-square plots in which 8 ecotypes were represented were observed from 1938 to 1942. The northern ecotypes were earlier in maturity and lower in forage production than the southern ones. The local ecotypes were intermediate. Higher seed-set was obtained with the local ecotypes, which flowered in late August or September. The early northern ones suffered the hot winds of midsummer at flowering time and the later southern ones were sometimes frosted in Oct. There were significant differences between ecotypes with regard to time of flowering, dry wt. at end of growing season, and ht. A high correlation existed between actual flowering date and a theoretical date computed from Hopkins' bioclimatic law which takes into consideration the difference in latitude, longitude, and altitude of the original sources. A highly significant correlation was found between flowering date and dry wt. of plant at close of season. The regression coefficient for the effect of flowering date on dry wt. of plant was detd. Winter injury of southern ecotypes was observed in rod-square plots in which 8 ecotypes were tested. It appears to be advisable to test ecotypes carefully before seed is transported great distances for large scale plantings.—*Auth. summ.*

18970. De Rosayro, R. A. The montane grasslands (papanas) of Ceylon—an ecological study with reference to afforestation. III. *Trop. Agric. [Ceylon]* 102(2): 81-94. 1946.—A detailed description of ecol. succession in the papanas is given. The frost theory and grass-fire theory are discussed and criticized. The thesis is developed that the dry papanas of the Uva Basin form a natural grassland climax or climatic climax.—*C. A. Schroeder*.

18971. Deyl, Mileš. Plants, soil and climate of Pop Ivan. Synecological study from Carpathian Ukraine. *Opera Bot. Cechica* 2: 1-290. 12 fig. 1940.—The associations are arranged in a new floristic-ecological system. For establishing the lower sociological units (sociation and association) the chief criterion is found in the dominant and constant spp. The determination of characteristic spp. (in the sense of Braun-Blanquet) is criticized in detail. For establishing the higher sociological units (federation, formation and

tribe), use was made of the edaphic-climatic agents in the order of their increasing importance for the association. The soils are likewise arranged in a unified system in the order of the importance of the action of the soil-forming agents: climate, mother rock and vegetation. The climatic region with the soil-forming processes in which the action of the general climate prevails (soil region) was taken as the highest unit. This region was divided into several soil formations (climax, praeclimax, postclimax, water, zoogeneous soil). The further division was based on the substratum (14 soil types), and finally the soil types were divided according to their plant cover into soil facies. The author ascertained the relations of the microflora of the soil to the Alpine associations. The number of bacteria and of their physiol. groups was detd. in the different soils. The decomposing action of the different organic substances of the association was followed in the soils of the different associations. The speed and size of the decomposition (after the CO<sub>2</sub> exhaled) depend not only on the origin of the organic substratum but also on the soil in which the decomposition takes place. A number of permanent microclimatological stations, according to the maximum-minimum soil temperatures and evaporation, differentiate the different ecological character of the associations. Another important agent is the differentiation of the associations proved to be the minimum winter temperatures and the average summer temperatures and their standard deviation depending mainly on exposure. The influence of exposure was followed also by measuring the temperatures in the course of the solar days on different slopes. Differences in insolation were determined from the records of the Campbell-Stokes photometer. In the morning hrs. the average sunshine is far greater than in the afternoon; therefore the eastern slopes have a more favorable insolation, and according to their vegetation they are really markedly warmer than the western slopes. The measurements of precipitations, made by various stereopluviometers, prove that the total precipitations received by slopes of different inclination depend strongly on the wind. The author detd. also the mechanical composition and physical character of the different soils: size of the grain, contents in air and water of the soil. The depth of the soil profile has a marked influence on the differentiation of the associations. Further, the author determined the drying-out of the soils, the variations of soil humidity in the course of the year, capillarity, infiltration into the soil, osmotic pressure of the soil solutions. The author followed the total water contents in the plants of different covers, the total contents in organic substances of a certain area, and the N contents of the plants at a given moment. From among the physico-chemical soil agents were detd. the importance of pH, the influence of the qualitative and quantitative composition of the adsorption soil complex. The contents of adsorbed bases and hydrogen and their correlations are important factors of the habitat. From among the chemical agents the author followed the importance of N, C, organic substances (humus), firmly bound water and their behavior in the soil profile in the most widely different associations. Consideration was given to the migration of elements in the profile under the influence of various soil-forming processes and to the proportion of each element in various soil types. The author makes recommendations for the practical economy on the Alpine pastures of the region.—*S. Prát*.

18972. Duchoň, F. (*Agric. Res. Inst., Praha, Czechoslovakia*). Biologické základy zákonů o přibývajících a ubývajících vytezcích pudních a zákon o hospodářské zastupitelnosti vegetačních faktorů. [Biological principles concerning the increase and decrease of soil productivity and the law of economical capability of replacement by other vegetation elements.] [In Czech with Ger. summ.] *Sbor. České Akad. Zem.* 15: 168-189. 1940.—The vegetation curves are not always in the form of the Mitscherlich curve, but in most cases are convex-concave or convex curves. In certain cases the curves were almost linear. The vegetation factors or the producing factors can be mutually replaced.—*E. Jermoliev*.

18973. Eggeling, W. J. (*For. Dept., Uganda*). Observations on the ecology of the Budongo rain forest, Uganda. *Jour. Ecol.* 34(1): 20-87. 2 maps, 3 pl., 9 fig. 1947.—The situation, geology and general climate of Budongo forest



are descr. The mean annual rainfall on the edge of the forest is about 1500 mm. (59 in.). Until recently man has had a negligible influence on the forest, but elephant and fire play a major part in controlling development. The forest is comparatively young. Although it is spreading, it is unable to colonize pure stands of elephant grass. The least advanced type of closed forest at Budongo is Colonizing Forest, in which one associates and one consociates are recognized. Colonizing Forest is succeeded by Mixed Forest and Mixed Forest is succeeded by Ironwood Forest, which is the climatic climax. Swamp Forest is regarded as an edaphic climax. Both climaxes are consociations. An account is given of the methods used to investigate the forest. Floristic composition was studied in 11 sample plots each 122 m. (400 ft.) square. Structure is illustrated by means of profile diagrams constructed from data from clear-felled plots. Colonizing Forest is shown to be 2-storied, Mixed Forest 4-storied and Ironwood Forest 3-storied. The stratification of Ironwood Forest and of Mixed Forest differ only in the fact that in Ironwood Forest the topmost (emergent) layer is composed almost entirely of the same tree (*Cynometra alexandri*) which dominates the main canopy. In Mixed Forest the 2 top layers are composed of different spp. Shrub and herb strata are described. Climbers, epiphytes, parasites and saprophytes are discussed. A description of the forest types is followed by a comparison of Budongo with other forests in Uganda and with rain forests elsewhere in the tropics. The climax type at Budongo is shown to have a close general similarity with consociations described from British Guiana, although fewer understory spp. are present.—*Auth. summ.*

18974. Emory, S. T. (*U. North Carolina, Chapel Hill.*) North Carolina flatwoods. *Econ. Geogr.* 22(3): 203-219. 1946.—The environmental conditions in the outer coastal plain are described. The region has extensive swamps and much sand. Irrigation is discussed.—*S. S. Visser.*

18975. Ferreira Dos Santos, Natalina. Micorrizas endotróficas do género *Sequoia* Endlicher. [Endotrophic mycorrhizas of *Sequoia*.] [With Eng. summ.] *Dir. Geral Serv. Florest. e Aquic. Pub.* 9(2): 203-219. 4 pl. 1942.—Examination of the roots of many specimens of *S. sempervirens* and *S. washingtoniana* (*S. gigantea*) in Pena State Park, Sintra (Portugal), showed the presence of one or more fungi forming symbiotic association with the trees. The infected roots are short, abundant, and intumescent, with small nodular formations. On *S. sempervirens* these are ovoid and isolated or in chains; on *S. washingtoniana* they are round and usually isolated. They appear to be of the endotrophic type, and to belong to the series "Paris quadrifolia" of Galaud, or the group "viscicola-arbusculo" of Burges and other authors.—*W. N. Sparhawk.*

18976. Foggie, A. Some ecological observations on a tropical forest type in the Gold Coast. *Jour. Ecol.* 34(1): 88-105. 5 fig. 1947.—The forest is composed of 3 strata, a very open layer of emergents exceeding 120 ft., an open dominant layer at 30-120 ft. and closed understory of small trees or tall shrubs 10-30 ft. high. Below the understory the herb layer varies greatly depending on the amt. of light reaching the ground. The understory is wholly evergreen but about 2/3 of the other layers are deciduous. This description is based on the forest of the Bobiri Reserve but forest of the same type covers a very great area of the Gold Coast. It passes gradually into the Evergreen Forest to the southwest and the drier type to the north and east.—*A. O. Weese.*

18977. Fontes, Fernando Carvalho. Algumas características fitosociológicas dos "salgados" de Sacavém. [Some phytosociologic characteristics of the salt marshes of Sacavém.] *Bol. Soc. Brotariana* 19(2a Ser.) (2): 789-813. 6 pl., 8 fig. 1945.—The Tagus estuary is subjected to the tides, and receives water borne deposits. Three zones according to soil evolution, drainage, and vegetation are noted. The possible associations which form the salt-marsh vegetation are given, and the floristic lists, with their accompanying analytic characteristics, show some differences from those of Braun-Blanquet. The probable succession is from bare mud through the several *Salicornia* associations to the *Atriplicetum halimi ruderalis* as the climax on the higher ground, farthest from the salt water.—*J. L. Cartledge.*

18978. Gooding, E. G. B. Observations on the sand dunes of Barbados, British West Indies. *Jour. Ecol.* 34(1):

111-125. 2 fig. 1947.—Three sand dune areas in Barbados are desc. in some detail and two other seashore localities are briefly mentioned. Three more or less clear vegetation zones running parallel with the sea margin are traced: a pioneer zone with *Sporobolus virginicus*, *Euphorbia buxifolia* and *Philoxerus vermicularis* as its important members, followed by a zone dominated by *Ipomoea pes-caprae*, and finally a zone dominated by *Coccoloba uvifera*. There is a progression from low to higher growth forms as distance from the sea increases. Soil analyses show that the water contents and concs. of salt in water at 15 cm. depth are more or less similar in the corresponding vegetation zones of the tree areas and as distance from the sea increases the moisture content of the soil increases, the salt conc. in the soil water decreases as the pH decreases. The vegetation zones may be regarded as stages in a sere, but are held in a comparatively stable condition by topographic factors.—*Auth. summ.*

18979. Hewes, Leslie. (*U. Nebraska, Lincoln.*) Dissertations in geography in the United States, 1935-46. *Ann. Assoc. Amer. Geogr.* 36(4): 215-247. 1946.—A list of the approx. 150 doctoral theses in geography awarded by American universities in 11 yrs., arranged by subjects. This bibliography may be of distinct service to biologists.—*S. S. Visser.*

18980. Krause, E. W. Über Keimung und das Jugendwachstum im Hinblick auf die Entwicklung der Pflanzendecke. [Germination and juvenile growth with regard to vegetable cover development.] *Planta* 34(2): 138-153. 4 fig. 1945.—Germination and cultivation expts. were performed on a) members of "steppe heath" (dry turf) plant communities which reach their western limit in central Germany, and b) those endowed with various expansive powers. Germination of seeds was ordinarily uniform. In garden culture most of the members of highly expansive associations (*Triticum repens*—*Bromus inermis*—assoc., Mesobrometum, *Melica ciliata*—*Teucrium botrys*—assoc.) were able to utilize favorable conditions by rapid and vigorous growth and precocious flowering, whereas most spp. of non-expansive associations (*Carex humilis*—*Anemone pulsatilla* assoc., *Sesleria*—Mesobrometum, *Sesleria*—*Teucrium montanum* assoc.) kept their tardy development. The expansive power of an association in colonizing open grounds proved thus to be essentially dependent on the ability of their members to adapt their growth rate to favorable conditions. There were, however, certain deviations in a number or spp., showing that there are other co-operating factors.—*Max Onno.*

18981. Krause, P. G. Weitere Mitteilung zum Eberswalder Interglazial. (Provinz Brandenburg). [A further contribution on the Eberswald Interglacial.] *Ber. Reichsst. Bodenforsch.* 1941: 202-207. 1941.

18982. Krause, P. G., und H. Gross. Das Interglazial von Angerburg nebst Bemerkungen über einige andere ostpreussische Interglaziale. [The Angerburg Interglacial with remarks on some other E. Prussian Interglacials.] *Jahrb. Reichsst. Bodenforsch.* 60: 311-340. 1 fig. 1939 (1941).—Pollen analysis indications from different borings near Angerburg in East Prussia.—*W. Gothan.*

18983. Kuchler, A. W. (*U. Rochester, N. Y.*) A geographic system of vegetation. *Geogr. Rev.* 37(2): 233-240. 1947.—Examples are given showing the confusion in the nomenclature of vegetation types. Neither botanists nor geographers have yet succeeded in developing a generally acceptable system of terminology, and there has even been a question as to the possibility of developing a clear and simple classification of the world's vegetation. The author believes it possible to develop such a classification and, influenced by the method used in Koppen's classification of climates, has devised a system having a few basic groups, designated with capital letters, and a larger number of qualifications, designated with small letters. Combinations of capital letters appear primarily in transitions from one type to another. Some of the boundaries are arbitrary. There are 4 primary groups: B, broadleaf evergreen; D, broadleaf deciduous; E, needleleaf evergreen; and N, needleleaf deciduous. To these are added the capitals M for mixed growth of D and E, and S for semideciduous vegetation, composed of B and D. The capitals may be qualified by appropriate small letters, of which there are 4 groups.—*F. W. Foxworthy.*

18984. Lona, F., e Annamaria Torriani. Osservazioni sulla diffusione postglaciale dell'Abete nel versante meri-

dionale delle Alpi. [Observations on the postglacial spread of *Abies alba* on the southern side of the Alps.] *Nuovo Gior. Bot. Ital.* 51(1/4): 70-86. 8 fig. 1944.—By means of pollen analysis of peat deposits, the authors studied the postglacial forest history of the southern part of Venezia Tridentina, from 1000 to 1400 m. The following succession was established: 1) *Pinus*, 2) *Picea-Abies* (a) *Picea*, b) *Abies*, 3) *Fagus-Pinus* (a) expansion of *Fagus*, b) expansion of *Pinus*). In certain places, *Abies alba* formed a considerable part of the forests on the southern side of the Alps, after the pine period and until the beech period. The behavior of its expansion here was analogous to that on the northern side of the Alps, as shown by a diagram.—*Max Onno*.

18985. Malin, James C. (*U. Kansas, Lawrence.*) Grassland, treeless, and subhumid. A discussion of some problems of the terminology of geography. *Geogr. Rev.* 37(2): 241-250. 1947.—These terms, often applied to prairie regions in the U. S., are considered inappropriate, because they are applied to regions having definite natural characteristics. Descriptions have usually been made by persons who thought and expressed themselves in terms of other regions, where their principal experience was. Each natural region should be described in positive terms. It is suggested that such terms as super-humid, humid, subhumid, semihumid, semiarid, and arid, should be replaced by the terms wet, high rainfall, mid rainfall, low rainfall, and dry, or by more definitely quantitative terms. Terms descriptive of the vegetation should indicate what is present, not what is absent. The climax vegetation of each region should be described according to independent standards of measurement and treated as normal.—*F. W. Foxworthy*.

18986. Manique e Albuquerque, J. Pina. Zonas fitoclimáticas e regiões naturais do continente Português. [Phyto-climatic zones and natural regions of continental Portugal.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 569-591. Map. 1945.—Agronomic zoning, as exemplified in the "Agronomic Map" now in progress, is a requisite for the fitting of cultural practices into their proper ecologic regions. Ecological zoning requires three kinds of studies: soils, climate, and indicator vegetation. Ecological zones of the coastal regions and of the interior are given with their coefficients of aridity, obtained from temp.  $\times$  100/precipitation in mm. The 12 natural regions, after a primary division of northern and southern Portugal with major Atlantic and Mediterranean influences, respectively, are mapped and described. A single dominant or characteristic tree is indicated for each region. Within each region the 400 m. and 700 m. contours serve to separate forest climax zones. Sections within regions are differentiated by geologic formation, altitude, and topography.—*J. L. Carlledge*.

18987. Moolman, J. H. (*U. Stellenbosch, S. Africa.*) The Orange River, South Africa. *Geogr. Rev.* 36(4): 653-674. 1946.—An effective summary of climatic, runoff and land-use conditions in the various parts of this valley. Drought and soil erosion are serious, and resource depletion is rapid. The native flora and fauna have been drastically affected.—*S. S. Visser*.

18988. Myre, M. Contribuição para o estudo de algumas comunidades vegetais da classe Rudereto-Secalinetales Br.-Bl. dos arredores de Lisboa. [Some plant communities of the class Rudereto-Secalinetales near Lisbon.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 699-727. 3 fig. 1945.—Exotic weeds are naturalized with difficulty, and usually are limited to artificial stations. Regional limitations apply both to cultivated and wild plants, and some weeds are regularly associated with certain crops such as wheat and flax in Portugal. Phytosociological lists are presented for 15 communities near Lisbon, and these are compared with the associations described by Braun-Blanquet for the Mediterranean region. While some common features with associations and higher social categories are noted, there are differences in both presence and absence of many species. Although they are not thoroughly studied, there are associations and sub-associations peculiar to Portugal, due in part, probably, to the Atlantic influence.—*J. L. Carlledge*.

18989. Negri, G. Stratificazione delle biocenosi. Caratteri e nomenclatura. [Stratification of biocenoses. Characters and nomenclature.] *Nuovo Gior. Bot. Ital.* 50(1/2): 122-140. 1943.—A detailed survey on the present status of the above problems.—*Max Onno*.

18990. Negri, G. Sul significato fitogeografico di *Laserpitiu gaudini* Moretti (*L. krapfii* Crantz subsp. *gaudini* (Moretti) Thellung 1925). [The phytogeographical significance of *L. k. ssp. gaudini*.] *Nuovo Gior. Bot. Ital.* 50(3/4): 155-208. 1943.—*L. krapfii* ssp. *gaudini* (Umbelliferae) was studied by the author at its westernmost station, at Oropa in the Piedmontese Alps. Comparison of his own observations with literature notes from other parts of its area (extending over the southern and central Alps as far as Alto Adige) made it possible to characterize its ecology as follows. It is a heliophilous plant, hence prefers heath and open shrub communities (e.g., of *Pinus montana*, *Alnus viridis*, *Rhododendron*, etc.) chiefly in the montane and subalpine zones, requiring a moderate oceanicity and preferring a calcareous soil. These conditions are much the same for the ssp. *marginatum*, of the Illyrian countries, whereas the 3d ssp., *alpinum*, in the Carpathian Mts. with isolated stations in Bosnia, is calciphobous. Therefore, *L. k. ssp. gaudini* is ascribed to the endemic component of the southern Alpine flora. On the other hand, as a ssp. of *L. krapfii*, it must be genetically considered as an Illyrian element, whose ancestral form probably immigrated with Karst flora from e. to w. along the foot of the E. Alps and then, during postglacial, diffused to inner-Alpine localities and those at the n. side of the main chain. Finally, a study of the general distribution of the genus *Laserpitiu* as a whole indicates that the genus, and the ssp. in particular, belong to the Western Tertiary element of European flora.—*Max Onno*.

18991. Nuttonson, M. Y. Agroclimatology and crop ecology of the Ukraine and climatic analogues in North America. *Geogr. Rev.* 37(2): 216-232. 1947.—This study has reference to the exchange of plant material between the Ukraine and N. America. After discussing the object and method of procedure, there are discussions of the General and Comparative Geography of the Ukraine, Climate of the Ukraine and its American Analogues, Natural and Agricultural Belts, the Mixed Forest Belt, the Forest Steppe Belt, and the Grassland or Steppe Belt. There is a map showing the location of the Meteorological Stations of the Ukrainian S.S.R. and listing areas containing their climatic analogues in the U. S. Table I gives selected examples from the agroclimatic chart of the Ukraine and climatic analogues in the U. S.—*F. W. Foxworthy*.

18992. Pearsall, W. H., and W. Pennington (Mrs. T. G. Tufin). Ecological history of the English Lake District. *Jour. Ecol.* 34(1): 137-148. 2 fig. 1947.—There are grounds for assuming that the Windermere drainage system has passed through the following stages: a late glacial and immediate post-glacial phase of rapid erosion and stabilization by vegetation (pine-birch forest); a steady state of alder woods and oak forest; a phase of primary (upland) occupation by man and incipient forest degeneration, with disappearance of high level pine-heaths (say 1500 B.C. to A.D. 900); a period of secondary (valley) occupation (by the Norse), increased grazing and accelerated degeneration (say A.D. 900-1300) accompanied by draining of alder swamps and "mosses"; a period of economic exploitation for wool and timber (ca. A.D. 1300-1750) with extreme woodland and soil degeneration; and romantic period of replanting and amenity exploitation (A.D. 1750-1940).—*Auth. summ.*

18994. Rawitscher, Felix K. (*U. São Paulo, Brazil.*) The utility of precipitation-effectiveness formulas for plant ecology. *Geogr. Rev.* 37(2): 251-253. 1947.—Conditions in certain parts of Brazil indicate that modifications are necessary in the use of formulas for the determination of precipitation-effectiveness. A striking instance is the existence of shrubs on dry soil that are neither xerophytic nor subxerophytic. Cactaceae and Bromeliaceae are almost entirely lacking, and plants that retain their foliage in the dry season have broad, often delicate, leaves without heavy protection against excessive transpiration, and they transpire even in the driest hours of the driest season. The explanation is that there are large water reserves in the deeper layers of the soil, which may dry out to a depth of 2 or 2½ meters. Beneath this depth, the soil is always humid, with much water available. The deeper-rooted plants always get water. Some of the plants send their roots down to the water table at 18 m. These plants behave more like swamp plants, but the swampy condition is separated from the surface by 1 to 2½ m. of temporarily dry soil. Human influences, of which

annual burning is an example, must also be considered.—*F. W. Foxworthy.*

18995. Rivas Goday, Salvador. (*U. Madrid, Spain.*) *Facies subhalofitas del Schoenetum nigricantis: origen y sucesion.* [Subhalophytic facies of the Schoenetum nigricantis: origin and succession.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 373-448. 16 pl. 1945.—The distribution of the *Schoenus nigricans* association may be divided into 2 major sub-areas; an Atlanto-European and mid-European area characterized by the Schoenetum genuinum (Schoenetum typicum), and a region bordering the Mediterranean, which because of variation in ecological origins within and because of the climatic difference, presents 2 facies, Schoenetum genuinum and Schoenetum halophytum. In the latter may be included subhalophyte facies, Schoenetum gypsophilum, on soils of the interior which are rich in  $\text{CaSO}_4$ . On the Spanish littoral an association in Valencia Province is characterized by *Schoenus nigricans* and *Juncus maritimus*, while inland between Zuero and Villacanas in Toledo Province the association with *Orchis palustris* and *Darycnium jordanianum* approaches the Schoenetum genuinum. These areas were studied in detail, and lists of spp. and measurements of edaphic factors are given. The successions before and after the appearance of the Schoenetum are discussed, and the different origins, either from halophytic associations or from aquatic associations are indicated, as are the relations with soil humidity and the other factors. The natural climax which might eventually succeed the inland association, difficult to determine because of the effects of human interference, and especially grazing of animals, may be the Quercion ilicis. The littoral association, which is circumscribed by narrow limits of water and salt tolerance, may be succeeded by *Ammophila* or by *Scirpus-Agropyron* associations, with a climax in which *Pinus halipensis* is dominant.—*J. L. Carledge.*

18996. Rodriguez, Francisco Bellot. (*U. Santiago de Compostela, Spain.*) *La asociacion del Quercus suber L. en el Quercion ilicis de la Marianica y Oretana.* [The association of *Q. suber* in the Quercion ilicis of the Marianica and Oretana.] *Bol. Soc. Broteriana* 19(2a Ser.) (2): 539-564. 1945.—The Quercion ilicis constitutes the tree cover for the entire Marianica range, but the climax, in which *Quercus ilex* is accompanied by *Q. lusitanica*, *Juniperus oxycedrus*, *Erica arborea* and *Pistacia terebinthus* is less common than subclimax and subseries stages. The most extensive subclimax stages are those with *Cistus* spp. Some subseries stages arise through clearing or cultivation by man, following which the oaks are not able to reestablish themselves. In the completely forested eastern part of the range a con-climax containing several oaks is recognized. In the mountains *Q. suber* forms associations which are, in large part, subordinate to the Quercetum ilicis, but generally on soils of pH 6.2 to 6.4, and with a characteristic group of smaller species. In other places, where the soil is acid and the humidity high *Q. suber* forms a subassociation of the association Quercetum ilicis. Only in cases of excessive soil acidity may this oak form the independent association Quercetum suberis.—*J. L. Carledge.*

18997. Thomson, P. W. *Das Interglazial von Ringen bei Dorpat und die Gliederung des Diluviums im nördlichen Ostbaltikum.* *Zeitschr. deutsch. geol. Ges.* 92: 603-606. 1940.—The development of the forests is similar to that of Schleswig-Holstein, Denmark and central Russia. In Denmark the climate seems to have been warmer in the Eem interglacial period than in the post-glacial warm period. In the latter time *Fagus sylvatica* was absent, *Carpinus* and *Picea* were present; the postglacial warm time was evidently cooler here than the interglacial. The climatic zones during the Eem period have been distributed differently from today.—*W. Gothan.*

18998. Thomson, P. W. *Die Klima- und Waldentwicklung des von K. Orviku entdeckten Interglazials von Ringen bei Dorpat/Estland.* [The development of the climate in the forests of the interglacial deposits near Ringen (Rõngu) near Dorpat/Estland.] *Zeitschr. deutsch. geol. Ges.* 93: 274-282. 2 fig. 1941.

18999. Vaughan, R. E., and P. O. Wiehe. *Studies on the vegetation of Mauritius. IV. Some notes on the internal climate of the upland climax forest.* *Jour. Ecol.* 34(1): 126-136. 3 fig. 1947.—The mean monthly temp. range

within the forest was 7.4°F., and the daily range of R.H. did not exceed 5% for the greater part of the year. About 2/3 of the total rain falling on the canopy reached the forest floor. Comparative meteorologic data are given for the forest station and an exposed station.—*A. O. Weese.*

19000. Zohary, M. (*Hebrew U., Jerusalem.*) *A vegetation map of western Palestine.* *Jour. Ecol.* 34(1): 1-19. Map. 1 fig. 1947.—The Mediterranean phytogeographical region is characterized by arboreal climax communities, the Irano-Turanian by steppe and the Saharo-Sindian is the most barren. The classification of plant communities within these regions is based not only on the climax vegetation, but on subclimax and segetal communities. 34 vegetational areas are mapped.—*A. O. Weese.*

#### OCEANOGRAPHY

(See also Entries 19011, 19012, 19039, 19049, 19050, 19051, 19072, 19075, 19082, 19086, 19092, 19093, 19095, 19098, 19099, 21003, 21008, 21015, 21017, 21018, 21023, 21027, 21028, 21029, 21030, 21031, 21032, 21182)

19001. Dons, C. *Norges koralrev.* [The coral reefs of Norway.] *K. Norske Vidensk. Selskab Forhandl. [Trondhjem]* 16A: 37-82. 15 fig. 1943.—Along the Norwegian coast there are about 65 recent reefs and about 35 subfossil ones, 8 of which are now lying above sea level. The most characteristic species, forming the main part of every reef, is the madreporarian coral *Lophelia pertusa*. *Lophelia* reefs (map) are known from few localities on the western side of the Atlantic Ocean, and from Tristan da Cunha, but are far more common along the coasts of Africa and Europe from Cape Verde to near North Cape, including the Mediterranean and Iceland. For a long time only subfossil reefs were known from the Oslo Fjord, but small occurrences of living *Lophelia* have recently been found. The northernmost reef is situated at Söröya, 70°57' N. lat. The largest of the Norwegian reefs (map) is w. of Senja Island, about 69°14'. The reefs grow only in places with strong current. Therefore they are found on prominent parts of the edge of the submarine continental platform; nearer the coast, and in the fjords, they prefer places where the tidal currents have to pass thresholds in the bottom or promontories. The minimum depth of living *Lophelia* is not 150 m. as was assumed before, but 60 m. in the Trondheim Fjord, and 90 m. out among the skerries near the open sea. Under Arctic conditions, in West Finnmark, no coral reef has been found at depths <250 m. The reefs grow not only on solid rock, but also on submarine moraines. The min. temp. at Norwegian reefs is +4°C (W. Finnmark). The salinity may exceptionally be only 33‰. Together with *Lophelia* is often found the madreporarian *Amphelia ramea* (syn. *oculata*), but it is less common (map). The fauna of the reefs also include a great number of other Anthozoa, several of them penetrating as far north as *Lophelia*, and many other animal species of which a great number have been found exclusively on these reefs. A list is given of 6 Spongia, 30 Coelenterata, 29 Vermes, 48 Echinodermata, 32 Crustacea, 34 Mollusca, 5 Ascidia, and 4 fishes all belonging more or less regularly to the reefs.—*O. A. Høeg.*

19002. Eggvin, Jens. *The movements of a cold water front.* *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 6(5): 5-151. 16 maps, 1 fig. 1940.—Meteorological and oceanographic data are presented and discussed in relation to the herring fishery along the coast of Norway. By a knowledge of the distribution of air pressure the movements of the Baltic current can be predicted. Fishermen can be told when and where to expect good or poor fishing, and at what depth to fish. Most of the temp. records were made by sea-thermographs supplied by Negretti and Zompra of London and installed on ships which ran regularly along the Norwegian coast. The instruments are discussed. Seasonal variations in temp. and salinity along the coast are presented. Interrelation of temp., salinity, and wind action are studied at length. Because of these relations southern surface waters are colder in winter and warmer in summer than the northern waters. Fish are sometimes frozen to death along the Skagerrak coast near Oslo but not in the northern areas. This is because southern waters are strongly stratified resulting from a great difference in densities in the poorly saline water near the surface and the high salinity of deeper layers. Stratification is stable in the south, but northern waters are more



homogeneous, allowing vertical circulation. Winds blowing away from shore cause a sharp fall in temp. in summer but a rise in temp. in winter because the surface water is moved away and warmer water from beneath replaces it. Special consideration is given to south-easterly storms during late Jan. and early Feb., 1937, and the movements of the cold water front they produced. This water was traced by its temperature, salinity, and density. The speed of the current was 9.4 naut. miles per day. Fishing fell off suddenly and ceased when this cold, saline poor water reached the fishing grounds. By rapid analysis of meteorological and oceanographic data such conditions can be predicted well in advance.—J. S. Dendy.

19003. Hayashi, K. On the detection of calcium in the calcicoblasts of some reef corals. *Palao Trop. Biol. Sta. Stud.* 1(2): 169-176. 3 pl. 1937.—A general consideration.

19004. Nugent, L. E. Jr. Coral reefs in the Gilbert, Marshall and Caroline Islands. *Bull. Geol. Soc. Amer.* 57(8): 735-780. 2 pl., 15 fig. 1947.—A comprehensive study of many atolls, banks and islands, with detailed maps, extensive bibliography. Concludes that Daly's Glacial Control Theory is well supported here, while the subsidence theory is not.—S. S. Visser.

19005. Yonge, C. M. (*U. Glasgow, Scotland.*) The influence of man on marine life. *Endeavour [London]* 6(21): 3-10. Map, 5 fig. 1947.—Popular account of effects of hunting, incidental dispersal, canal building, etc. Details of oyster cultivation in new localities are given.—G. W. Sinclair.

#### LIMNOLOGY

(See also Entries 18960, 19027, 20963, 21019, 21020, 21025, 21033, 21035, 21089, 21163)

19006. Wundsch, Hans H. Der Götting-See, ein See-erz führendes Gewässer in der Mark Brandenburg. *Arch. Hydrobiol.* 38(4): 590-662. 42 fig. 1942.—Götting Lake is primarily an enlarged reach of the Havel near Potsdam that, in 1877, was cut off from the river by 2 dams. It is 0.9 sq. km. in extent and 5 m. deep, 62% of the bottom being richly carpeted with submerged plants. Compared with other Havel lakes, no chem. or biol. difference is evident except the occurrence of lacustrine ore in the deeper parts of the bottom. As Götting Lake is a eutrophic water with a fairly high amt. of carbonate, evidence is given that eutrophy does not hinder the sedimentation of lacustrine ore, known so far only in acid lakes of northern Europe. The origin of the ore is the Fe compounds of the ground water, entering the lake 1-3 m. under the surface. The sedimentation did not start before the dams were erected.—Ingo Findenegg.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 18921, 18956, 18961, 19002, 19005, 19335, 19375, 19381, 20196, 20206, 20217, 21177, 21180)

19007. Bergmann, W., and E. M. Low. (*Bingham Oceanogr. Lab., New Haven, Conn.*) Contributions to the study of marine products. XX. Remarks concerning the structure of sterols from marine invertebrates. *Jour. Organic Chem.* 12(1): 67-75. 1947.—This report reviews many of the questions regarding the fine structure of the sterols from marine invertebrates. C-24 epimer sterols are discussed and a system for their classification is proposed. The differences in sterol content between the pelecypods (bivalves) and gastropods (snails) are shown.—R. C. Ellingson.

19008. Bjerkan, Paul. Fisken og havet. (Fra Fiskeriundersøkelserne i 1942). Brislingundersøkelser i 1942. [The fish and the sea (From Fishery research work in 1942.) Sprat investigation in 1942.] *Fiskeridirektoratets Skrifter Serie Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 7(10): 24-32. 1945.—The size and quality of the sprats (*Clupea sprattus*) caught on the Norwegian coast varied from one district to another and from one locality to another in the same district. Especially at the southernmost part of the west coast the 1-yr.-old sprat was smaller than observed any previous yr. under observation. Owing to good food conditions in the outer part of the fjords, the older as well as the younger sprats were mostly fat. Small size of the sprat of the 1941 year-old class was attributed to be a result of late propagation and development on proper spawn-

ing places. This was probably the result of a very cold spring.—J. S. Dendy.

19009. Callamand, Odette. [Euryhalinity and stability of the blood pH among fish.] *Bull. Inst. Océanogr. [Monaco]* 799. 1-7. 1941.—Studies on stenohaline fish (carp and tench) showed that a significant lowering of blood pH occurred when the fish were transferred from fresh water to a soln. containing NaCl (17 to 25/1000). Similar decreases in pH occurred when the augmentation of salinity was made progressively. Similar experiments with silver eels result in no significant changes in the pH of the blood when the eels were transferred from fresh water to saline concentrations of 25 to 32/1000. Some indication of the method of maintenance of normal pH of the blood of eels was shown by detg. the pH of the water. During 8 hrs. after immersion of 2 eels in fresh water no appreciable changes occurred, but during 9 hrs. after immersion in 6 l. of a soln. of 32 g. NaCl/1000 the change was from pH 8.04 to 7.79. The elimination of CO<sub>2</sub> permits a stable alk. reserve in eels (euryhaline) but in the carp (stenohaline) the acidosis is not compensated. The question is raised as to whether the uncompensated acidosis is a primary factor in the death of the stenohaline fish placed in saline.—Eleva G. Shipley (courtesy Chem. Absts.).

19010. Chapman, Wilbert McLeod. The wealth of the ocean. *Sci. Month.* 64(3): 192-197. 6 fig. 1947.—Sonar instruments and occasional accidental catches have revealed large schools of fish at depths of 1000 ft. or more and at distances of hundreds of miles from shore. The Japanese, by maintaining several fully equipped fishery research ships, were able to use such schools, of such familiar fish as sardines, tuna, and herring, and to catch 4 times the tonnage Americans did and compete strongly in the American market.—H. F. Copeland.

19011. Dannevig, Alf. Østersbassenget ved Flødevigen. [Oyster basin at Flødevigen.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 8(3): 5-11. 1945.—The construction, size, and operation of artificial oyster breeding and rearing pools are described. The pools are 16.5 m. above sea level. Sea water is pumped into the bottom. Fresh water can come in and is controlled. A thin layer of fresh water on top is allowed to freeze and insulate the deeper salt water. Insulation is especially good with snow on the ice. If the top layer is very salty the water cools to -2° before icing over. Daily and weekly measurements were made for temp. and salinity. Weekly records were obtained for salinity, pH, dissolved O<sub>2</sub>, at depths of 0, 1, 2, 3, 3.5 meters. Records of plankton and the breeding and development of larvae were secured.—J. S. Dendy.

19012. Dannevig, Alf. Undersøkelser i Oslofjorden 1936-1940. Egg og yngel av vårgytende fiskearter. [Investigations in the Oslo Fjord 1936-1940. The egg and young of spring breeding fish species.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 8(4): 1-91. 1945.—In recent yrs. the hydrographical and biol. conditions of Oslo Fjord, Norway, have been studied more intensely. The fjord is 55 naut. miles long and is divided into several basins by submerged barriers. In the outer part, fresh water from rivers affect salinity of surface layers. The inner part is affected by sewage. Rainfall and direction of wind affect salinity. The amounts of fish eggs and larvae were studied from 1936 to the spring of 1940. Horizontal hauls with nets were made at several depths for eggs and young fish each spring. Results show spawning to be intense in the outer fjord from the beginning of March. In the inner fjord spawning is less intense until April when there is an abundance of spawn. Eggs do not develop well in inner fjord, but are normal in outer fjord. Poor hatching is attributed to the presence of sewage. Late development of plankton in inner fjord provides poorer nourishment for early hatched larvae. Numbers of larvae caught varied considerably in 1936, 1937, 1938, and 1939. Artificially hatched cod fry have been released in the inner fjord. This expt. is to be continued.—J. S. Dendy.

19013. Fagerland, Else. Oppdrett av østersyngel 1933-1943. [Production of young oysters, 1933-1943.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 8(3): 12-55. 1945.—A yearly log of events is presented. In the early days, leaf mold gave trouble. Fertilization of the water is discussed. Elevation

and salinity are discussed in relation to production. The outer of 2 pools was used as a rearing pond. Some control over temp. was possible. The advantages of using an artificial pool for studies of production of oysters are considered in detail.—J. S. Dendy.

19014. Fraser, C. McLean. Food of fishes. *Trans. Roy. Soc. Canada Sect. 5* 40: 33-39. 1946 (1947).—Some account is given of the stomach content of five species of Pacific fishes, spring, coho, and chum salmon (*Oncorhynchus tshawytscha*, *O. kisutch* and *O. keta*, respectively), herring (*Clupea pallasii*) and dog-fish (*Squalus suckleyi*), taken at various times throughout the yr., as an indication of the basis of the food supply. Notes on the stomach content of 10 other spp. in which too few examinations were made to give any general statements are added.—Auth. abst.

19015. Humphrey, G. F. (U. Sydney, Australia.) The endogenous respiration of homogenates of oyster muscle. *Australian Jour. Exptl. Biol. and Med. Sci.* 24(4): 261-267. 1 fig. 1946.—Basic factors affecting the oxygen-uptake of the adductor muscle of *Saxostrea commercialis* were studied. Muscle was homogenized in various solutions including water and one approximating to the inorganic composition of the muscle itself; little change in the oxygen uptake resulted. However, when used alone, Na and K salts accelerated, while Ca and Mg salts inhibited respiration. The  $Q_{O_2}$  of the homogenates was  $-0.21$ . The mean values, in mg. % for the conc. of some elements in the muscle, were K  $381.7 \pm 18.9$ ; Na  $372.9 \pm 13.0$ ; Ca  $45.76 \pm 3.28$ ; Mg  $79.93 \pm 3.03$ ; Cl  $733.4 \pm 17.3$ . The findings were discussed in relation to the euryhalinity of the organism.—George Humphrey.

19016. Kesteven, G. L. A procedure of investigation in fisheries biology. *Australia Counc. Sci. and Indust. Res. Bull.* 194. 1-31. 1946.—Fisheries biology is devoted to the analysis of a complex system, comprising natural elements on the one hand, and economic elements on the other. Its program can be divided into 3 major phases: an exploratory phase in which the major elements are isolated and the character of their relationships examined, mainly qualitatively; an appraisal phase in which an effort is made to obtain more precise data on the elements and their relationships and to give greater quantitative expression to these; and a phase of control in which these results are applied to ensure that the fishing machinery remains in such relationship to the fish stocks that the catch is taken most economically, and maintained at the highest possible level in quantity and composition, with depletion prevented. A brief summary is given of the investigational procedures employed to this end.—E. Winters.

19017. King, Joseph E. (U. S. Fish and Wildlife Serv., New Orleans, La.), and William T. Penfound. (Tulane U., New Orleans, La.) Effects of two of the new formagenic herbicides on bream and largemouth bass. *Ecology* 27(4): 372-374. 1946.—Tests were made with 2 new formagenic herbicides, 2,4-D (2,4-dichlorophenoxyacetic acid) and SLI-23 (a product of Southwestern Louisiana Institute), to determine their effect on fingerling bream, *Lepomis macrochirus*, and largemouth bass, *Huro salmoides*. The fish were subjected to the following conditions: tapwater control, 1 ppm. of herbicide, 100 ppm. of herbicide, under hyacinth plants as a control, and under hyacinth plants sprayed with 1,000 ppm. of herbicide. Solns. of 1 ppm. of 2,4-D had no effect, whereas 100 ppm. produced a low but significant mortality. The SLI-23 at concs. of 100 ppm. produced total mortality within a few hrs.; 1 ppm. had a very slight toxic effect. Fish under hyacinth plants sprayed with 1,000 ppm. 2,4-D or SLI-23 experienced no ill effects until the plants began to die and the subsequent oxidation lowered the dissolved  $O_2$  content of the water beyond the toleration limits of the fish. The results indicate that, whereas the introduction of these chemicals into the immediate environment of the fish may have harmful effects, spray applications to surface vegetation at the rates recommended by the manufacturer will not be directly toxic to fish life. When the sprayed plants die, however, any fish trapped in the immediate vicinity and unable to escape to open water will probably die of asphyxiation.—Authors.

19018. Løversen, Ragnv. Yngelens overflytting til oppdrettetsfeltene. [Moving the young to the oyster beds.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept.*

*Norwegian Fish. and Marine Invest.* 8(3): 75-95. 1945.—For several yrs. the proper types of substratum and the best time for moving oysters were studied. War conditions made detailed research impossible. Records are chiefly observations. The earliest possible breeding was observed. Young oysters ought to be moved out to rearing grounds while food and temp. are optimal in both breeding and growing places. To attain this the breeding and growing grounds must be under constant control.—J. S. Dendy.

19019. Løversen, Ragnv., og S. Hansen. Forsøk med forskjellige samlere sommeren 1942. [Investigation with different substrata (for oyster culture) in the summer of 1942.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 8(3): 72-74. 1945.

19020. Mathisen, Ole. Forsøk med forskjellige samlere sommeren 1941. [Investigation with different substrata (for oyster culture) in the summer of 1941.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 8(3): 56-71. 1945.—Whitewashed material was most effective, especially brick. Mats of brush made good substratum. Five brush mats gave the greatest number of oysters but coarser mats produced oysters with greatest av. growth. Impregnation of material with copper gave negative results. The advantages of very weak copper impregnation are still being investigated. The depth in the basin at which the substrata gave greatest number of young lay between 0.5 and 1.5 m., dependent on nutritive conditions and salinity. The mortality of oysters set in just after they become attached and in certain cases ran up as high as 50% in 3 weeks' time.—J. S. Dendy.

19021. Pennak, Robert W., and Ernest D. van Gerpen. (U. Colorado, Boulder.) Bottom fauna production and physical nature of the substrate in a northern Colorado trout stream. *Ecology* 28(1): 42-48. 1947.—Qualitative and quantitative bottom samples were taken at weekly intervals from June to Aug., 1945, in North St. Vrain Creek, a typical northern Colorado trout stream. 98.7% of the bottom organisms were Plecoptera and Ephemeroptera nymphs, Trichoptera and Diptera larvae, and Coleoptera larvae and adults. Ephemeroptera and Diptera accounted for 91.6% of the total. 39% of all individuals belonged to the genus *Pseudocloeon* (Ephemeroptera). Stonefly nymphs and beetles were found only on rubble and gravel. Mayfly nymphs occurred on all substrates but were most abundant on rubble where they averaged 450 individuals per sq. m. Trichoptera averaged 35 per sq. m. on bedrock and were much less common elsewhere. Diptera larvae were most abundant on bedrock and gravel where they averaged 254 and 222, respectively. Depending on the life histories, numbers of individuals in certain genera and spp. varied widely from week to week. The seasonal occurrence of maximum and minimum populations for particular forms was not concurrent from one substrate to another but widely variable. Average numbers of organisms for rubble, bedrock, gravel, and sand were 610, 551, 575, and 202 per sq. m., respectively. Corresponding wet wts. were 2.5, 1.7, 1.3, and 0.6 g. per sq. m. A stream survey should be based on an adequate number of samples taken from all substrates represented as well as on calculations of the relative percentages of substrate types comprising the stream bed.—R. W. Pennak.

19022. Richards, Oscar W. (Amer. Optical Co., Buffalo 15, N. Y.) Comparative growth of *Mytilus californianus* at La Jolla, Calif., and *Mytilus edulis* at Woods Hole, Mass. *Ecology* 27(4): 370-372. 1946.—Seasonal curves were obtained from statistical analysis of the growth data for *M. californianus* at La Jolla, Calif., furnished by Professor W. R. Coe and compared with growth data for *M. edulis* at Woods Hole, Mass. Changes in plankton, ocean temp., and solar radiation were related to the growth of the mussels. At La Jolla the mussel growth was greater and showed less seasonal fluctuations than did that from Woods Hole. The second growth cycle occurring in the fall along the Atlantic Coast was scarcely evident at La Jolla. The 4-yr. periods of growth compared are 1931-34 for *edulis* and 1940-43 for *californianus*.—O. W. Richards.

19023. Rose, E. T. (Iowa Conserv. Comm., Des Moines.) Lost Island fish census. *Iowa Conservationist* 6(4): 121, 126. 1947.—Studies indicated that 1,260 acre Lost Island Lake, Iowa, had a high population of black bullheads (*Ameiurus melas*). The creel limit was therefore removed. A

summer creel census indicated a catch of 153,878 fish in a 10-week period, all except 506 of which were bullheads. The average catch per hour was 5.22 fish. In July, the average weight was 3 ounces; in October, 4.4 ounces. Most of the bullheads were 5 yrs. old. Carp were also abundant and 130,000 lb. were removed by trapping.—K. D. Carlander.

19024. Runnström, Sven. Racial analysis of the herring in Norwegian waters. *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 6(7): 6-110. 8 maps. 1941.—The Norwegian herring fishery is based on different kinds of herring representing various stages in the life history of the fish. The large herring fishery is composed of full grown individuals which move to the coast in prespawning migration Dec. and Jan. Spring herring go to the coast to spawn in Feb.-Apr. There is no sharp limit between the two. The 2 kinds of herring were studied statistically regarding differences in vertebral counts. Mean vertebral number of 17,782 spring herrings collected throughout the Feb.-Apr. spawning season, yrs. 1932-1936, is  $57.324 \pm 0.005$ . That of 14,362 large herrings collected Dec.-Jan. of same period is  $57.182 \pm 0.006$ . This is a significant difference between the 2 populations. The spring herring mean vertebral number decreases in value from south to north. This is in accordance with presumed effects of the environmental factors because salinities and temp. in the coastal waters increase from s. to n., a condition which results from the cold Baltic current, low in salinity. The lower mean vertebral number for the large herring indicates that they spawn on more off shore banks in the North Sea covered by more saline water. Movement of the large herring to the coast seems to be related to an inflow of North Sea water. The spring herring represents a new immigration after that of the large herring has left the coastal waters. Different year classes show fluctuations of mean vertebral counts but over a long period of yrs. these fluctuations are parallel between large and spring herrings. Thus in the Norwegian waters there appears to be 2 natural groups of herring spawning in different water masses.—J. S. Dendy.

19025. Runnström, Sven. Quantitative investigations on herring spawning and its yearly fluctuations at the west coast of Norway. *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 6(8): 5-71. 5 maps. 1941.—Fluctuations of herring fisheries offer great problems to the fisherman. By sampling the quantity of roe deposited on the spawning banks, the strength of the herring stock was estimated. One ♀ herring contains about 20,000 eggs, a volume of 50 ml. Bottom samples which contained roe ranged in depth from 5-150 meters. Richest spawning was in depth of 20-80 m. Herring apparently prefer to spawn on stony or rocky bottom. Herring masses were located by means of echo sounding. In spite of the occurrence of great masses of herring in the open sea, the spawning immigration to coastal waters may be unimportant and therefore the fishery a failure. Fluctuations in spawning immigration of herring are closely related to variations in hydrographical conditions. The main spawning seems to take place in water with salinity of 3.3-3.4‰ and temp. of 5-6°C. Predicting the herring fishery on the basis of the estimated strength of the stock alone is unsafe because irregularities in meteorological conditions may cause great shifts of water masses, suddenly altering the conditions for spawning near the coast.—J. S. Dendy.

19026. Snieszko, S. F., and C. C. Taylor. (*U. S. Fish and Wildlife Serv., Kearneysville, W. Va.*) A bacterial disease of the lobster (*Homarus americanus*). *Science* 105(2732): 500. 1947.—During the summer of 1946 there was a heavy mortality of lobsters along the coast of Maine. Micrococci of the *Gaffkya* type were found in the blood smears and the blood culture. The diseased lobsters had a pink discoloration of the ventral abdomen and the blood which was also pink had a prolonged clotting time. The severity of the disease decreased with colder weather, although an outbreak was reported in Dec. The organism was regularly isolated from diseased lobsters in pure culture and could be grown on the standard media. Lobsters inoculated with pure cultures of the organism died within 2 wks. with typical symptoms of the disease. Sulfonamides reduced the mortality among lobsters which contracted the disease in a natural way.—H. M. Kaplan.

19027. Soares Soeiro, Joaquim Antônio. A maceração

industrial do canhamofautor de despovoamento aquícola. [Industrial maceration of hemp as a factor in the destruction of aquatic life.] [With Eng. summ.] *Direc. Geral Serv. Florest. e Aquíc. Pub.* 9(2): 259-269. 1 pl. 1942.—Disappearance of fish from the Almonda River in central Portugal is the result of pollution by wastes from hemp-maceration plants. Expts. with live fish (*Leuciscus aulatus*) showed that death of the fish was due to oxidation of organic matter, which proceeds so slowly that the effects are felt far downstream. Fermentation of large quantities of waste may develop sufficient sulphurous acid to kill fish. With low water and high temp. in summer, the conditions are aggravated.—W. N. Sparhawk.

19028. Sund, Oscar. 1945. *Fisken og havet*. (Fra Fiskeriundersøkelserne i 1942.) *Sildundersøkelser i 1942*. [The fish and the sea. (From the Fishery research work in 1942.) Herring investigations in 1942.] *Fiskeridirektoratets Skrifter Ser. Havundersøkelser Rept. Norwegian Fish. and Marine Invest.* 7(10): 3-23. 1945.—Because of the war, investigations at sea were impossible in 1942, except in the winter when samples could be gotten through fisheries superintendents. In this way 24 samples were secured. Figures show (1) the distance north and south of Bergen, Norway, to the points where collections were made and the average lengths per sample; (2) av. age; (3) proportional aunts. of first time spawners; (4) av. vertebrae; (5) av. condition; (6) av. state of maturity; (7) the sex composition of the samples; (8) correlation between state of maturity and av. vertebrae figures; (9) correlation between condition and maturity figures; (10) av. age and length composition for the later 9 yrs.; (11) the proportional magnitude of the winter herring stock; (12) a comparison of age composition of winter samples 1919-1938, 1941, and 1942; (13) av. length of winter herring yr.-classes for each 1942 sample; (14) length composition of all 8-yr.-old winter herrings examined; (15) length composition of all winter herrings 8, 9, and 10 yrs. old; (16) annual increments of 8-yr.-old herrings of northern and southern coast types; (17) annual increments of all 8 yrs. old as in above (16); (18) % composition of fat and dry matter in herring from 3 winter samples.—J. S. Dendy.

19029. Young, R. T. Spawning and setting season of the mussel, *Mytilus californianus*. *Ecology* 27(4): 354-363. 3 fig. 1946.—Expts. conducted for 2 yrs. on the California mussel from 3 locations near the Scripps Inst. of Oceanography at La Jolla, Calif., have shown marked differences in spawning season between mussels in different places. Conclusions of spawning season are corroborated by observations on the setting of young mussels. Setting follows spawning by 1-3 months, and is apparently uninfluenced by tides or currents, but may be influenced by turbulence.—R. T. Young.

19030. Anonymous. Pearl shell, beche-de-mer and trochus industry of Northern Australia. *Australia Dept. Comm. and Agric. Econ. Rept.* 1. 1-104. 6 pl. 1946.—The pearl oysters *Pinctada* spp. and self-inhabiting molluscs *Trochus* spp. constitute the main source of marine pearl shell. The pearl shell fishery of Northern Australia accounts for about £400,000 per yr. in the overall amt. of £4,000,000 for the total Australian fisheries. This fishery supplies 2,000-3,000 tons of the world's 4,000-5,000 tons of shell produced annually. The shell is used mainly for the manufacture of buttons and ornaments. The U. S., England, and Czechoslovakia are the main markets for the shell. Recommendations for the rehabilitation of the fisheries based on 8 surveys of the industry dating back to 1890 are presented. A short résumé of the artificial culture of oyster pearl is given in the appendix.—W. Arcisz.

19031. Anonymous. The fish liver oil industry of South Africa. *Bull. Imp. Inst. [Gr. Brit.]* 44(1): 20-23. 1946.—The industry concentrated along the coast of Cape Province supplies about 1/4 of Britain's requirements for Vitamin A fortification of margarine. The oil is obtained from the valhaai (*Galesrhinus canis*), a shark and fish offal. Some commercial fishes have large oily livers and low muscle fat and others the opposite. Sharks have large (10-34% of their wt.) oil livers (25-80% oil) with considerable oil in the muscle. The oil is extracted by steam cooking. The A and D concentrates are prepd. by saponification, absorption on activated carbon or by molecular distillation. The relative



potencies of S. African fish liver oils are given.—*M. A. Barmore.*

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 18786, 18936, 20311, 20313, 20329, 20605, 21212, 21215, 21216, 21217, 21225, 21228, 21236)

19032. Baskett, Thomas S. (*Iowa State Coll., Ames.*) Nesting and production of the ring-necked pheasant in north-central Iowa. *Ecol. Monogr.* 17(1): 1-30. 20 fig. 1947.—An investigation of nesting and natural production of the ring-necked pheasant (*Phasianus colchicus torquatus*) was made on a 1520-acre area in north-central Iowa during 1939, 1940, and 1941. Any location which permitted ♂♂ to be locally conspicuous was satisfactory for crowing; returning to an exact spot used before for crowing was infrequent. Although individual ♂♂ tended to stay within an area through April until mid-May, at least, any real territories seemed extremely plastic. Fighting among ♂♂ appeared to be caused by attempted intrusions. Choices of nesting sites probably rested with the hens. Data on locations of 533 nests were obtained; nests being found by systematic patrolling of fields. Hayfields, small grains, and fencerows harbored the greatest number of nests. Proportions of success in small grains were high, in fencerows low, and in hayfields intermediate. Over a third of all nests were deserted as a result of agric. activities. Crows were the most destructive predators. The relation of seasonal progress of nesting to the timing of agric. activities did not seem to be the key to observed differences in yearly nesting success. Estimated numbers of chicks attaining the age of 7 weeks on the 1520 acre area were: 1939—247, 1940—305, 1941—588. Rates of summer gain in relation to breeding density showed trends similar to those indicated by N. Dakota data for the same years, suggesting the operation of mechanisms on population gains affecting a large area.—*T. S. Baskett.*

19033. Bowers, Glen L., and Ward D. Tanner. Spring and summer populations of ruffed grouse in central Pennsylvania. *Pennsylvania Game News* 17(12): 6-7. 1947.—A critical survey of 2 areas suitable for ruffed grouse habitation was made by using drumming counts in spring and fall, as well as actual observations. Nesting, incubation and brooding were studied. Excessive rainfall and predation are factors given for high mortality of broods. Adult populations were increased by only a few young survivors.—*R. J. Greb.*

19034. Faber, Lester F. (*Iowa Conserv. Comm., Des Moines.*) The history of stocking and management of ring-neck pheasants in the state of Iowa. *Iowa Conservationist* 5(10): 73, 75, 78; (11): 81, 84; (12): 93; 6(1): 97, 103. 1946/1947.—Ringneck pheasants, *Phasianus colchicus torquatus*, were first stocked in Iowa in 1900. State distribution was by eggs (1910-1932), by young birds (since the establishment of the first game farm in 1913), and by trapping wild birds and collecting wild eggs (since 1924). The first

open season was in 1925. Stocking in southern part of state was unsuccessful compared to that in northern half, despite greater effort in the south. Scientific study began in 1930. Peak populations in 1929, dropped until 1935 then increased to 1943. Dropped since 1943 despite less hunting pressure. Rearing costs, \$.66-\$.85 per bird stocked. Since 1935, value of stocking investigated, and more emphasis placed on habitat improvement.—*K. D. Carlander.*

19035. Rutherford, R. M. Pittman-Robertson contributions to forest game restoration and management. *Jour. Forest.* 44(6): 419-423. 1946.—The Federal Aid in Wildlife Restoration Act of Sept. 2, 1937—popularly known as the Pittman-Robertson Act—was designed to provide aid to the States in the restoration of wildlife. This article reviews the program to date, with the conclusion that it has resulted in substantial progress toward better management of forest wildlife and in bringing back vanished spp. to habitats suitable for them.—*Courtesy Exp. Sta. Rec.*

19036. Schumacher, S., und v. Marienfrid. Jagd und Biologie. Ein Grundriss der Wilkünde. [Hunting and biology. A sketch of game-knowledge.] *Verständliche Wissenschaft*, 44. 136p. 94 fig. Julius Springer: Berlin, 1939. RM. 4.80.—An experienced hunter treats in short and popular form the biological and physiological facts of central European game animals. The various factors influencing pelage in Cervidae (among which Vitamin D is highly important) and means of age determination are particularly considered.—*Max Onno.*

19037. Wagar, J. V. K. (*Colorado A. and M., Fort Collins.*) The contest for western public game fields. *Jour. Forestry* 45(5): 323-328. 1947.—Western public lands were open to legitimate settlement for many yrs. before scientists urged that remaining lands be created national forests, parks, and grazing lands. Grazing specialists effectively conserve range resources and maintain meat production. Stockmen, caught between reduced stocking, need for funds to meet increasing living standards, and crowding civilization, seek ownership of valuable key portions of public lands. Increasing leisure and transportation-ease attach growing public values to these lands. Wildlife and other recreation values overtake livestock production values. Adequate tax equivalents remove economic reasons for placing lands in private ownership. States which disposed of public lands now buy private lands to create national forests and parks. Scientific and human factors involved require an impartial study of all values before disposing of public lands to pressure groups.—*J. V. K. Wagar.*

19038. Anonymous. Game. *Nova Scotia Repts. Dept. Lands and Forests* 1945: 76-109. 3 fig. 1946.—A report on game in Nova Scotia for 1945, including information on moose, deer, beaver, grouse, pheasants, rabbits, bears, muskrats, silver foxes, fur-bearing animals and fur farming, game sanctuaries, statistical data on licenses, etc., and a paper entitled *This Predator Legend*, by J. B. Abbott (pp. 87-94).—*Courtesy Exp. Sta. Rec.*



# BIOLOGICAL ABSTRACTS

Editor-in-Chief, JOHN E. FLYNN; Associate Editor, JEAN MACCREIGHT

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## GENERAL BIOLOGY

A. H. GRAVES, *Editor*

(See also Entries 22607, 22902, 23189)

### PHILOSOPHY OF BIOLOGY

21239. Ackoff, Russell L. (*U. Pennsylvania, Philadelphia.*) Experimental definitions. *Bull. Inst. Exptl. Method* 1(1): 1-7. 1947.—The author reviews the rationalist, empiricist and pragmatist approaches to defining, and discusses in more detail the approach of the experimentalist. By way of summary we may set down the experimentalists' demands in defining a concept, in the following directions: 1) Make explicit the formal conditions which specify how pertinent observations are to be made in responding to any questions concerning a concept (communication). 2) Make explicit the formal conditions which specify how efficient responses are to be made to questions concerning the concept from the pertinent observations (content). 3) Make explicit the formal conditions which specify how the answer to questions concerning the concept may be indefinitely approached (purposefulness). 4) Formulate the conditions in these 3 directions with respect to the historic demands inherent in the concept so that they can be investigated (progress). Progress in defining is evidently possible without such self-consciousness as is involved here, but the less patient who would not merely let defining go its own way must face the necessity of just such self-conscious formulation. It is time philosophy ceased being a reflective witness to the scientific game and became an active participant.—*Auth. summ.*

21240. Churchman, C. West. (*U. Pennsylvania, Philadelphia.*) Plan for an Institute of Experimental Method. *Bull. Inst. Exptl. Method* 1(2): 1-13. 1947.—The objectives of the plan are: To offer an educational program, graduate and undergraduate, for training of experts in exptl. methodology; to offer courses to science and liberal arts students in the meaning, theory and application of science's methods for determining answers to questions; to act as a consultant group for research projects within and outside the university; to hold periodic conferences on special problems in the sciences in which an active cooperation of various branches of science and methodology is required; and to publish a technical journal on the theory and application of exptl. method. The program would provide a center to combine mathematical statistics with the philosophy of science and the history of science. A detailed graduate and undergraduate curriculum outline is given.—*M. C. Johnstone.*

21241. Churchman, C. West. (*U. Pennsylvania, Philadelphia.*) Logic of statistical tests. *Bull. Inst. Exptl. Method* 1(3): 12-30. 1947.—It has been shown how the ill-defined concepts of "deductive" and "inductive" inference received more precise definitions with the modern concepts of "formal" and "statistical" inference and in what way formal and statistical inference are incomplete. To understand the proper application of statistical inference, a general concept of exptl. inference is necessary. Exptl. inference is based on the precept that all phases of the inferential method are investigatable. This implies that a complete exptl. inference is an idealized concept, and that science approaches this ideal in the manner of a spiral that is infinite but bounded. The morals for the statistician are briefly: a) realization of the necessity of contributions from other fields in order to make statistical theory "complete"; b) proper evaluation

of the necessity for presuppositions in inquiry, and the manner in which they affect the validity of a result; c) realization of the intimate dependence of statistical theory on a science of value.—*Auth. summ.*

21242. Churchman, C. W., and R. L. Ackoff. (*U. Pennsylvania, Philadelphia.*) A footnote to "Logic of Statistical Tests." *Bull. Inst. Exptl. Method* 1(4): 21-23. 1947.—This note formalizes certain general remarks made at the end of "Logic of Statistical Tests." The requirements for an Operating Efficiency Curve are given.—*M. C. Johnstone.*

21243. Cowan, Thomas A. (*U. Nebraska, Lincoln.*) The historian and the philosophy of science. *Bull. Inst. Exptl. Method* 1(2): 1-13. 1947.—The author reviews briefly the development of the philosophy of science and of history in the modern period and its relation to the dominant philosophical schools of this era: rationalism, empiricism, and relativism, the latter leading to scepticism. He suggests that "a beginning of an escape could be made is all agreed that the purpose which science exists to attain cannot be a purpose native to one inquirer and foreign to another. It must be a purpose common to all . . . the most pressing task of modern philosophy of science to answer . . . for only in the light of the central purpose of all science can the separate sciences know when they are progressing and when retrogressing. And only in the light of the central purpose can the separate sciences even so much as know what their subject matter is."—*M. C. Johnstone.*

21244. Hill, Douglas W. *Science*. Chemical Publishing Co.: Brooklyn, N. Y., 1946. Pr. \$2.75.—The author believes that the aim of science is to assist and not to destroy mankind. He states that if the scientific method is applied in the "non-scientific" fields in religion, ethics, politics, education and leadership, man will learn how to use the technical inventions of science as stepping stones to social and economic progress. He believes that science means the power to think logically, dispassionately, impersonally, objectively, and thoroughly, according to a definite pattern that can be consciously adopted and that man can be taught to extend knowledge by ordered expt., and to act fearlessly in the conclusions reached. The chief contribution, that science and scientists have to make to the world's welfare has never been tried.—*Courtesy Amer. Jour. Digest. Dis.*

### INSTITUTIONS, ADMINISTRATION

21245. Bartlett, Kenneth A. Federal Experiment Station in Puerto Rico. *Chem. Digest* 6(3): 61-63. 1947.—Descriptions of the location of the main station at Mayaguez and its several tracts with their elevations are given. The exptl. work and the services rendered are briefly summarized. They include the study and introduction of insecticidal plants; cultural and breeding work with *Cinchona*; maintenance of an outstanding collection of Western Hemisphere tropical plants; selection and breeding of a sweet corn adapted to the tropics (USDA 34); introduction of forage grasses, new sugarcane vars., beneficial insects, resistant bamboo vars., vanilla beans, spices and essential oils.—*O. J. Worthington.*

21246. Bykov, B. A. [A review of the research work of the Botanical Faculty of the Kazakh (S. M. Kirov) State



University.] *Sovetskaya Botanika* [Leningrad] 1941(3): 200-201. 1941.—The main published works since the foundation of the Univ. in 1934 and those still in manuscript are enumerated.—*Courtesy Hort. Absts.*

21247. Carton, P. L'oeuvre de l'Institut des Recherches Agronomiques et Forestières de l'Indochine, au cours de la période 1925-1943. *Agron. Trop.* 1(3/4): 115-124. 1946.—A brief general account of the work of the Institute (incorporating numerous laboratories and expt. stations in different parts of Indochina) is given, together with a list of publications.—D. W. Goodall.

21248. Lininger, F. F. (*Agric. Expt. Sta., State Coll., Pa.*) The Pennsylvania Agricultural Experiment Station. *Chem. Digest* 6(4): 72-73. 1947.—Efficient production and marketing for Pennsylvania agriculture, the program of this station, is more specifically exemplified by the work in proper land use, research in processing and storage of agric. products, and a new corn program. The latter involves a synthesis of the best efforts of the various sciences, agricultural engineering and economics. The land study includes not only the factors of soils, fertilization and crops but reforestation and new types of pasture grasses for poor land. Other projects are mentioned.—O. J. Worthington.

21249. Van Cleave, Harley J. (*U. Illinois, Urbana.*)

A history of the Zoology Department in the University of Illinois. *Bios* 18(2): 74-97. 1947.—Gives history 1868 to date with principal contributions of T. J. Burrell, S. A. Forbes, H. B. Ward, et al., with the development of the Museum of Natural History and an outline of some of the diversifications of interests expressed and developed.—L. J. Gier.

#### MISCELLANEOUS

21250. Jones, W. Paul. (*Iowa State Coll., Ames.*) Writing scientific papers and reports. ix+115p. Wm. C. Brown Co.: Dubuque, Iowa. 1946. Pr. \$2.50.

21251. Yancey, P. H. (*Spring Hill Coll., Spring Hill, Ala.*) Supplement to origins from mythology of biological names and terms. *Bios* 18(1): 49-53. 1947.—About 90 additional words.

21252. Anonymous. Directory of Biological Laboratories. 3rd ed. 117p. Burns Compiling and Res. Organization: Chicago, 1947. Pr. \$3.—Lists all laboratories of the U. S. which are concerned with biological, bacteriological or biochemical investigations. Personnel and professional data are given for the laboratories listed. It includes research laboratories, consulting laboratories and those related to manufacturing processes.

### BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entry 22038)

#### HISTORY

21253. Dunn, Charles Wesley. Historic meeting (June 25, 1946) to commemorate fortieth anniversary of original federal Food and Drugs Act. 269p. 20 fig. Commerce Clearing House, Inc.: New York, 1946. Pr. \$3.—This book is dedicated to the memory of Dr. Harvey W. Wiley, founder of the National Food and Drug Law. His portrait is the frontispiece. The book includes 16 addresses made at the meeting by eminent representatives of the government and industry. A few titles which may be especially noted are: "Its great founder" by Anna Kelton Wiley, "Its distinguished administrators" by Fred B. Linton, "Its administrative progress" by Paul B. Dunbar, and "Its basic significance for public health" by Thomas Parran. In addition to the addresses, copies are given of letters of appreciation and tributes received from a very large number of individuals, federal and state officials, civic and industrial organizations and other countries.

21254. Polak, Mitja. (*U. Jena, Germany.*) Eine medizinisch-geschichtliche Untersuchung über die Italienfahrten der letzten drei sächsischen Kaiser und über die Todesursachen Kaiser Ottos II. und Ottos III. *Zeitschr. Hyg. u. Infektionskrankh.* 126(1/2): 246-254. 1944.—Historical documents studied by the author revealed that Emperor Otto II. was ill after the campaign against the Saracens in the summer of 982 and very probably suffered from malaria. In Dec., 983, he suffered from an intractable constipation which he tried to cure himself by taking excessive amts. of aloes, thus effecting a lethal intoxication with gastro-enteric symptoms. Emperor Otto III. undoubtedly died of variola. Presumably he also suffered from malaria and measles shortly before his death.—H. Simons.

21255. Weiss, Harry B. Entomological medicaments of the past. *Jour. New York Ent. Soc.* 55(2): 155-168. 1947.—A summary of the use of insects in medicine during past times.

#### BIBLIOGRAPHY

21256. Arquivos da Faculdade Nacional de Medicina. Volume 1, Number 1, July 1946. Editor-in-Chief: Carlos Chagas. Editorial Secretary: Mário Araújo Filho. 111 pages (9 articles) in the first issue. Published by the Ministério da Educação e Saúde, Universidade do Brasil, Faculdade Nacional de Medicina, Rio de Janeiro, Brasil.—The following papers comprise this issue: Influências da tiúreia e do hormônio tireotrópico sobre a fixação de iodo pela glândula tireóide de ratos, by Antonio Couceiro and E. de Robertis; Sensibilização da acetilcolina pela tiamina, by Paulo de Carvalho; Penetração do radioiodo no colóide do folículo

tireoidiano, by C. Chagas, E. de Robertis, and A. Couceiro; Nervo laringeo inferior não recorrente e artéria subclávia direita retro-esofágica (Importância desta anomalia do ponto de vista clínico-cirúrgico), by Lily Lages; Sarcoma osteogênico esclerosante do fêmur, by Castro Araújo; Los alcaloides del fagara coco (Gill.) Engl., by Venancio Deulofeu; Hemorragias funcionais uterinas conceito e classificação, by Arnaldo de Moraes; Insulinas de accion prolongada, by Venancio Deulofeu; and Olifofrenia acompanhada de calcificações intracranianas múltiplas, by José Leme Lopes.

21257. Lawrence, Barbara. Bibliography of publications by Glover Morrill Allen. *Proc. New England Zool. Club* 24: 1-81. 1947.—An annotated bibliography, in which new forms have been listed, the field covered has been briefly outlined, and information of taxonomic or other importance not indicated in the title has been summarized. Reviews written by him are included.

21258. Matthes, Ernst. Welche Zeitschriften sind für ein zoologisches Institut am wichtigsten? [Which publications are most important for a zoological institute?] *Mem. e Estud. Mus. Zool. Univ. Coimbra* 122: 1-57. 1941.—A study with numerous tables, covering a total of 928 publications, of which 346 are in a shorter list. The number of articles published in each in 1935-37, with the number of articles in each of several subdivisions of zoology, and the general classification of the publication, as being zoological, biological, or other ["fremde"], are given. There are various special lists, such as the 46 publications considered most important for systematic zoology. The paper is intended to be suggestive rather than final in its conclusions.

#### BIOGRAPHY

21259. Beale, G. H. Timiriazev, founder of Soviet genetics. *Nature* [London] 159(4028): 51-53. 1947.—K. A. Timiriazev (1843-1920) was born to a father of noble family but republican views, and an English mother. He was an anglophile throughout his life: he translated English novels in his youth; was an ardent advocate of Darwinism; gave a Croonian lecture, and was later a member of the Royal Society. His advocacy of progressive movements, and his views on freedom of thought and instruction, repeatedly interrupted his studies, his teaching, and again his professorship at the University of Moscow. His own research was mostly on photosynthesis, and he was ahead of his time in insisting on the physiological basis of agriculture. His major intellectual effect, however, was in his polemic advocacy of Darwinism against Danilevsky and Strakhov in the early days, and against the too narrowly enthusiastic Mendelians of this century. Timiriazev was not, however,

anti-Mendelian; he incorporated the idea of Mendelian segregation into natural selection. His advocacy of Darwinism may have helped to consolidate it in developing views of dialectical materialism, and his book "Science and Democracy" welcomed the new order in 1920.—*R. Walker.*

21260. Beloshapko, M. A great Russian agronomist. *U.S.S.R. Inform. Bull.* 7(7): 22. 1947.—Klikaevy Arkadiyevich Timiriazev (1843-1920) was called the Russian Darwin and one of the world's foremost botanists. He made many expts. in plant physiology, trained research workers, was a tireless translator of European publications and published over 150 of his own articles and many books. In Tsarist Russia, persecuted by officials, he worked to improve the backward agriculture of the untrained peasants and supported the socialist revolution. He sent his last book "Science and Democracy" to Lenin. His name has been given to the largest higher agricultural school, his teachings are now studied by millions. A fine portrait of Timiriazev is given on p. 1 of this issue.

21261. Blacker, C. P. Galton's outlook on religion. *Eugenics Rev.* 38(2): 69-78. 1946.—Galton's life span, 1822-1911, was during a serene period of economic expansion and scientific progress, a period of hopeful expectations about man's future. In his outlook on religion he found no place for belief in theocratic intervention nor the efficacy of prayer. Galton's beliefs may be summarized as follows: (1) Religion gave cohesion and social consciousness to the tribe. (2) Man has exerted great influence upon the human race as evidenced by changes in the character of populations. (3) Mental and moral qualities are inherited like physical ones. We need more mental independence, tolerance, cooperativeness. The hereditary taint due to the slavishness of the mass men growing out of primeval barbarism must be bred out of the race before our descendants can become free members of a free and intelligent society. (5) Very severe competition under harsh conditions may retard progress. (6) Since evolution is functioning, religion must be concerned with directing human evolution. Man has already furthered evolution considerably for his own personal advantages. He does not yet acknowledge it to be his religious duty to do so deliberately and systematically. (7) Galton did not believe in the objective efficacy of prayer, but in its subjective efficacy. He states, "the constitution of the living Universe is a pure theism, and that its form of activity is what may be described as cooperative." His niece describes him as a "religious agnostic."—*A. R. Middleton.*

21262. Colliver, F. S. Bibliography of Charles J. Gabriel. *Victorian Nat.* 63(9): 199-201. 1947.—From 1908-1939, titles of 44 publications are listed.—*Olga Lakela.*

21263. Flahaut, Martha Reeke. (*Wash. State Mus., Seattle.*) Samuel Frederick Rathbun. *Murrelet* 27(3): 41-46. 1 pl. 1946.—Biographical sketch of a pioneer northwest ornithologist.—*J. W. Slipp.*

21264. Fulton, John F. Harvey Cushing. A biography. vii+754p. Chas. C. Thomas: Springfield, Ill., 1946. Pr. \$5.00.

21265. Gilbert, E. J. Un mycologue francais: Léon

Joachim (1873-1945). *Bull. Trimestr. Soc. Mycol. France* 62(3/4): 126-134. 1946(1947).—Obituary notice of L. Joachim, French mycologist primarily interested in the Agaricaceae. A list of his mycological publications is given.—*E. K. Cash.*

21266. Grote, H. In Memoriam—Anton Reichenow. *Mitteil. Zool. Mus. Berlin* 25(2): 338-359. 1941.—Extensive biography of the well-known ornithologist.

21267. Olmsted, J. M. D. (*U. California, Berkeley.*) Charles-Édward Brown-Séguard. A nineteenth century neurologist and endocrinologist. 253p. Johns Hopkins Press, Baltimore, Md. 1946. Pr. \$2.70.—Brown-Séguard (1817-1894) was born a British subject at Port Louis on the British-African island of Mauritius. He was the son of Charles Edward Brown, a native of Philadelphia, in the American merchant marine and Charlotte Séguard, of pure French descent. Olmsted recounts in a delightful manner the 3 principal phases of Brown-Séguard's life. These were as: Mauritian student and free-lance investigator in Paris; His neurological practice and American professorships; In the Chair of Medicine at the Collège de France, Paris. Magendie, Bernard and Brown-Séguard spanned the XIX century from its first decade to its last, carrying on the great tradition of French exptl. physiology.

21268. Perrin, Tomás G. (*Inst. Estud. Méd. y Biol., México, D. F.*) A la memoria del doctor don Pío del Río-Hortega, Miembro Honorario de la Academia Nacional de Medicina, de México. *Bol. Lab. Estud. Méd. y Biol. [México]* 3(3/4): 67-78. 1945.—A eulogy.

21269. Staffe, A. Adametz. *Zeitschr. Zücht. Reihe B: Tierzücht. u. Züchtungsbiol.* 49: i-viii. 1 fig. 1941.—An obituary of Prof. Dr. Leopold Adametz with a list of his publications.—*G. Östergren.*

21270. Tansley, A. G. Frederick Edward Clements. *Jour. Ecol.* 34(1): 194-196. 1947.—Obituary notice.

21271. Vasiljev, A. V. Sergei Gaigorjevic Rinkul. *Sovetskaja Botanika [Leningrad]* 1941(3): 202-203. 1941.—Rinkul was an authority on sub-tropical plants. He worked at Suhum and Batum where he utilized his knowledge of plant acclimatization in introducing many spp. to the U.S.S.R. A list of published works and also manuscripts are given at the end of the notice.—*Courtesy Hort. Absis.*

21272. Villaseñor, Clemente. (*Inst. Estud. Méd. y Biol., México, D. F.*) Recordando al maestro. *Bol. Lab. Estud. Méd. y Biol. [México]* 3(3/4): 79-83. 2 fig. 1945.—In memory of Dr. Pío del Río-Hortega the 18 conclusions resulting from his study of the microglia of the central nervous system by his silver staining technique are presented.—*Leona Hudson.*

21273. Anonymous. Dr. T. S. Roberts, 1858-1946. *Passenger Pigeon* 8(4): 103. 1946.—The author of the *Birds of Minnesota* was born in Phila.; moved to Minn. at the age of 9; became a physician, M.D. from Univ. of Penn.; practiced pediatrics for 30 yrs. in Minneapolis; became the director of Minn. Mus. of Nat. Hist.; rec'd the Brewster Medal, a fellow of AOU. He published bird records, '17-'38, in form of Logbook.—*Olga Lakela.*

## EVOLUTION

ALFRED EMERSON, Editor

(See also: Mutant induction by chemical, Drosophila, 21298; Parallel series of associated characters in diverse insect groups, 21299; Effectiveness of selection by owls of deer mice of diff. color, 21378; Microspecies in Taraxacum, Scandinavia, 23131; Evolution Foraminifera, 23643)

21274. Amadon, Dean. (*Amer. Mus., N. Y. C.*) Ecology and the evolution of some Hawaiian birds. *Evolution [New York]* 1(1): 63-68. 1947.—Certain Hawaiian birds are extreme examples of adaptive radiation and divergence among closely related forms. Apparently competition for food among closely related congeneric species in the presence of numerous unoccupied ecological niches is among the causes. Sometimes specialized as well as generalized species have changed greatly. The mechanism and significance of such evolution are discussed.—*D. Amadon.*

21275. Castle, W. E. (*U. California, Berkeley.*) The domestication of the rat. *Proc. Nation. Acad. Sci. U. S. A.* 33(5): 109-117. 1947.—Changes in the rat under domestication include accelerated growth leading to larger size,

increased fertility, decreased savageness, and mutations in color or structure of the hair. 25 mutations which have occurred (and many of them recurred) are listed and linkage studies which show 4 linkage groups (involving 14 genes in all) are summarized.—*G. W. Lasker.*

21276. Dobzhansky, Th. (*Columbia U., N. Y. C.*) Adaptive changes induced by natural selection in wild populations of *Drosophila*. *Evolution [New York]* 1: 1-16. 1947.—The gene arrangement in the 3d chromosome of *D. pseudoobscura* is variable. Each gene arrangement occurs in populations of a definite geographic area. However, 2 or more gene arrangements may occur together in many populations. Inversion homozygotes and heterozygotes occur frequently in natural populations. The relative frequencies

of various gene arrangements in some populations undergo seasonal cyclic changes. These changes are produced by natural selection, and represent adaptive reconstructions of the population genotype, thus facilitating survival in different seasonal environments. Some of the changes taking place in nature can be reproduced experimentally in "populations cages." Populations containing desired proportions of chromosomes with different gene arrangements are introduced into the cages, samples of the eggs deposited by the flies in the cages are taken from time to time, and the incidence of the chromosomes of different types determined in these samples. The relative proportions of chromosomes with different gene arrangements remain constant in population cages kept at  $16\frac{1}{2}^{\circ}\text{C}$ . Changes are frequently observed in cages kept at temp. above  $20^{\circ}\text{C}$ : the incidence of some gene arrangements increases and of others decreases. However, the final outcome of the selective process is rarely a complete replacement of one gene arrangement by another. Instead, an equilibrium is usually reached at which all gene arrangements present in the initial population of an experimental cage are retained, but often with frequencies very different from the initial ones. The establishment of equilibria in the populations indicates that individuals heterozygous for different gene arrangements (inversion heterozygotes) are characterized by the highest adaptive values, while homozygotes are relatively inferior in survival and reproduction. The correctness of this interpretation is demonstrated by means of observations on deviations from the Hardy-Weinberg proportions of heterozygotes and homozygotes among the adult flies developed in the population cages.—*Th. Dobzhansky*.

21277. Epling, Carl. (*U. California, Los Angeles 24.*) Natural hybridization of *Salvia apiana* and *S. mellifera*. *Evolution* [New York] 1: 69-78. 1947.—The effects of natural hybridization of *S. mellifera* and *S. apiana* are described. Despite compatibility sufficient to permit frequent localized hybrid swarms, it appears that the constancy of the species is maintained. This is ascribed to a combination of isolating factors operating in a community in which the norm of succession, and hence the equilibrium of competition, is not materially modified. The potentiality of gene flow thus preserved might prove advantageous and provide a genotype which could exploit an abrupt change in environment.—*Carl Epling*.

21278. Heuts, M. J. (*U. Louvain, Belgium.*) Experimental studies on adaptive evolution in *Gasterosteus aculeatus* L. *Evolution* [New York] 1: 89-102. 1947.—Individual fishes belonging to the population complex, referred to as *G. aculeatus*, center in Belgium around 2 modes of morph. and physiol. characters, namely vertebral numbers, total length, number of lateral plates and chloride regulation of the blood. In Belgium one type occupies fresh water habitats and the other salt water habitats. Although individual morph. intergrades exist, no intermediate populations are found. Observational and exptl. evidence is reported, throwing light on the origin and maintenance of this characteristic morph. and ecological differentiation. The study of the correlation between morph. and physiol. characters, and of the hereditary transmission of these traits in a series of salinity-temp. conditions, reveals the mode of action of natural selection, especially in the egg stage. The physiol. properties of the adults, the inheritance of physiol. traits in hybrid eggs, and the limited recombination of the plate number genes are shown to be further evolutionary agents in this sp. The central position of the area makes it possible to explain indirectly the peculiarities of the geographical variability of the sp. throughout its Old World habitat. A hypothesis is advanced, according to which the 2 types have arisen through a series of primary and secondary linkage rearrangements from an originally single polygenic complex.—*M. J. Heuts*.

21279. Ives, P. T. (*Amherst Coll., Amherst, Mass.*) Second chromosome inversions in wild populations of *Drosophila melanogaster*. *Evolution* [New York] 1: 42-47. 1947.—190 chromosomes extracted from a local fruit orchard area in Sept., 1945, were tested for lethals by *Cy/Bl L* and for inversions by crossover reduction in net *b on bw*. 45.8% were lethal or semi-lethal and 8.3% contained inversions distributed at random in lethal and non-lethal chromosomes. Cross tests of the lethals showed 0.91% identical.

Comparisons with earlier data indicate only a slight decrease in minimum breeding population size in spite of only a 5% apple crop in both 1944 and 1945 when spring frosts killed the fruit, suggesting that the flies are independent of the fruit at that point in their annual cycle. Cytological analysis of the inversions by Dr. T. Hinton revealed that they are all probably *In(2L)t* or *In(2R)NS* which were found in equal numbers. These are probably the most frequent inversions in American populations, and the *Cy* inversions are most frequent in Russian populations, suggesting a difference in evolutionary trend in the 2 continents.—*P. T. Ives*.

21280. Spencer, Warren P. (*Coll. Wooster, Ohio.*) Genetic drift in a population of *Drosophila immigrans*. *Evolution* [New York] 1: 103-110. 1947.—The analysis of a sample of 110 wild flies from the Sept., 1944, population of *D. immigrans* in the village of New Wilmington, western Pennsylvania, showed a frequency of 10% for the gene, "stubble" bristles. In a sample of identical size, collected at a point almost  $\frac{1}{4}$  mile distant from the first collection area and in Sept., 1946, the gene frequency for stubble was 7%. The genes, "brick" eye color and "dubonnet" eye color, were also recovered more than once in both samples. The conc. of these genes in this "island" population is best explained by genetic drift brought about by seasonal fluctuations in population size. The role of the interaction of this factor with selection in establishing favorable adaptive combinations is discussed.—*W. P. Spencer*.

21281. Spieth, Herman T. (*City Coll. N. Y., N. Y. C.*) Sexual behavior and isolation in *Drosophila*. 1. The mating behavior of species of the willistoni group. *Evolution* [New York] 1: 17-31. 1947.—The mating behaviors of *D. capricornis*, *D. equinoxialis*, *D. fumipennis*, *D. nebulosa*, *D. sucinea*, and *D. willistoni* were observed in a cell under low magnification as well as in mass cultures. The mating activities were divided into 6 phases: (1) initiation; (2) posturing; (3) restimulation; (4) mounting; (5) insemination; (6) dismounting. Initiation, mounting, and termination are similar in all 6 species. Specific qualitative differences, however, do exist between each of the species and these are restricted to the posturing behaviors of the ♂, the ♀ activity signifying acceptance of the ♂, and the actual insemination period. The differences roughly parallel the morph. differences that exist between the spp. except for *willistoni* and *equinoxialis* which, although almost identical morphologically, show considerable behavioral differences. Initiation of the mating behavior, except for rare instances, is a function of the ♂. Once courtship has started it can be and in the greater percent of cases is broken off at one of the phases previous to copulation. Either sex may break off courtship, but it is primarily a function of the ♀ for, if she is not receptive, the ♂ is unable to copulate.—*H. T. Spieth*.

21282. Stebbins, G. L. Jr. (*U. California, Berkeley*), E. B. Matzke (*Columbia U., N. Y. C.*), and C. Epling. (*U. California, Los Angeles.*) Hybridization in a population of *Quercus marilandica* and *Quercus ilicifolia*. *Evolution* [New York] 1: 79-88. 1947.—Population samples of *Q. marilandica* and of *Q. ilicifolia*, gathered at Lakehurst, N. J., and of *Q. marilandica* from Cliffwood, N. J., were compared with herbarium sheets of these 2 spp. collected for the most part outside of the region of their geographical and ecological overlap. The following characters especially were studied: leaf width, number of veins on lower part of leaf, character of leaf base, pubescence of under surface of leaves, length of mature terminal buds of adult twigs, and depth of acorn cups. Hybrid indices were computed; the Cliffwood material had the same general range of scores as the standard of *Q. marilandica*; in the Lakehurst population approx. 37% of the individuals collected were *Q. marilandica*, approx. 28% were *Q. ilicifolia*, and the remainder showed varying degrees of intermediacy, the gene flow in this particular sampling being predominantly from *Q. ilicifolia* into *Q. marilandica*.—*Authors*.

21283. Stirton, R. A. (*U. California, Berkeley.*) Observations on evolutionary rates in *Hypsodonty*. *Evolution* [New York] 1: 32-41. 1947.—Attention is directed to a combination of phenomena closely associated with the evolution of hypsodonty (height of crown in cheek-teeth). There is a slight retardation in root closure and a slight continua-



tion of vertical growth in the cheek-teeth of species from the succeeding ages from the Middle Miocene to the Pleistocene. This study reveals different rates of evolution in progressive hypsodonty in the different orders, in the families of an order,

in the genera of a family, and in the species of a genus in late Cenozoic mammals. It is thought that many factors might play a role as important as hypsodonty in survival or longevity.—R. A. Stirton.

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 21245, 21275, 21276, 21277, 21278, 21279, 21280, 21282, 21319, 21358, 21629, 21682, 22500, 22542, 22546, 22594, 22595, 22635, 22676, 22677, 23142, 23145, 23229, 23332, 23410, 23415, 23640, 23844)

### PLANT

21284. Baldwin, J. T. (*William and Mary Coll., Williamsburg, Va.*) Hevea: A first interpretation. *Jour. Heredity* 38(2): 54-64. 1 fig. 1947.—This paper records a cytogenetic study of the controversial genus *Hevea*, with a discussion of its implications to taxonomy and to rubber production. The author considers the genus to consist of 9 spp., or fewer if certain reductions, which he suggests, are made. Suggestions are made for exptl. breeding and selection to improve disease resistance and latex production.—L. M. Dickerson.

21285. Clayton, E. E. A wildfire resistant tobacco. *Jour. Heredity* 38(2): 35-40. 4 fig. 1947.—The original resistant plants developed from galls of callus tissue on plants which were hybrids between *Nicotiana tabacum* × *N. longiflora*. One of 3 shoots from the callus was wildfire-immune and self-sterile but set seed freely with *N. tabacum* pollen. Selections from this back-cross were made and grown to F<sub>4</sub> and F<sub>5</sub> generations. The TL 106 selection described here is uniform and has the growth appearance of *N. tabacum*. It is resistant to both wildfire and blackfire. It is as susceptible as ordinary tobacco to such diseases as black root rot, blue mold, brown spot, frog-eye, and mosaic. Seed is available for distribution to research workers.—L. M. Dickerson.

21286. Crescini, Francesco. Genesi sperimentale di nuove forme coltivate e possibilità dei mezzi attuali. [Exptl. production of new forms of cultivated plants. Possibilities of the actual methods.] *Italia Agric.* 78(1): 13-20. 1941.—A review of publications on the creation of polyploids through exposure to low and high temps., to x-rays, or to the action of electromagnetic currents. No bibliography.—W. Bally.

21287. Davis, Bradley M. (*U. Michigan, Ann Arbor.*) The appearance of a balanced lethal situation in the *Oenothera heterozygote gaudens* franciscana following severe heat treatment of seeds. *Genetics* 32(2): 185-199. 1 pl. 1947.—The cross *lamarckiana* × *franciscana* gives one of twin hybrids, *gaudens* franciscana (laeta). When grown in selfed lines this plant reproduces itself and behaves like *lamarckiana* in failing to give *gaudens* *gaudens* (zygote lethal), but differs from *lamarckiana* in throwing a large class of etiolated seedlings which are franciscana franciscana and which take the place of *velans* *velans* (zygote lethal) in the breeding of *lamarckiana*. Seeds of *gaudens* franciscana were exposed to dry heat at high temps. for long periods in the hope of inducing a zygote lethal into the franciscana chromosome complex that would operate like the lethal in *velans* and in double dose eliminate the class of etiolated segregates, franciscana franciscana. Heat of 95°C killed seeds rather quickly but some seeds could survive an exposure for 6 days to heat of 90°C. In an F<sub>5</sub> generation of *gaudens* franciscana from dry seeds subjected to heat of 90°C for 5 days a culture, germination 16.5%, gave 10 plants of *gaudens* franciscana. Seeds from 9 of these plants selfed showed the normal high germination of around 80%, but seeds from one plant gave a low germination of only 36.2%. From this plant the selfed line was continued through large F<sub>7</sub>, F<sub>8</sub>, and F<sub>9</sub> generations with the low percentage of germination maintained and with a complete elimination from the line of etiolated seedlings representing franciscana franciscana. The breeding of the line thus became that of *lamarckiana*, i.e., zygote lethals suppressed the appearance of *gaudens* *gaudens* and franciscana franciscana. There is some discussion of the problem of chlorophyll inheritance presented by the class of etiolated segregates from *gaudens* franciscana.—B. M. Davis.

21288. Dermen, Haig. (*U. S. Pl. Indust. Sta., Beltsville, Md.*) Inducing polyploidy in peach varieties. *Jour. Heredity* 38(3): 77-82. 5 fig. 1947.—To evaluate the poly-

ploidy results so far obtained from various colchicine methods used for peach treatments, the following procedure is suggested as most likely to be successful: (1) Plant 1-yr.-old trees singly in soil in 12-inch pots between mid-Jan. and early Feb.; (2) Cut the plants back to a bud 2 feet above the soil level; (3) Allow one shoot to grow to a length of 5 inches or more and destroy other growth; (4) Break off the young leaves at the tip and cut off the remaining very young leaves and stipules with a sharp blade close to the terminal growing point; (5) Cover the tips with a pledget of absorbent cotton; (6) Leave one plant as control; (7) Use a 1% water-colchicine soln., with 2 drops of 10% Santomerse to each 10 ml. of the soln.; (8) The 3d day after trimming the tips, apply colchicine soln. to the pledgets, soaking them thoroughly. Application of colchicine immediately after trimming the tips may be one cause of injury from treatments; (9) Wet the pledgets with water once 2 days after the treatment. Wet the control tip whenever the treated tips receive either colchicine or water. Destroy all growth on the shoots below the treated area of the tips. Allow laterals to grow from any axillary buds that have been covered with the pledgets and been wetted with colchicine. If leaves showing sectorial or entire polyploidy are found in the upper region of the new growth, the shoots should be cut to such a leaf and new shoot growth forced at that point, either during that season or the following year. Colchicine expts. may be more successful if treatments are made early in the season when the weather is cool.—Haig Dermen.

21289. Kozo-Poljanski, B. Floral mechanism of *Lalle-mantia*. *Compt. Rend. (Doklady) Acad. Sci. URSS* 51: 645-647. 1946.—*L. iberica* is a source of oil, and the author considers a detailed knowledge of its flower to be necessary in plant breeding. The flower is figured and its pollination mechanism is described.—*Courtesy Hort. Absts.*

21290. Langham, D. G. (*Inst. Nacion. Agric., Maracay, Venezuela.*) Three useful gadgets for plant breeders. *Jour. Heredity* 38(1): 29-32. 3 fig. 1947.—The author describes and illustrates 3 useful aids to the plant breeder: a numbered stake for marking field expts.; a useful tag for marking artificial crosses in sesame; and an exhibition plate for seeds, crystals and other materials.—L. M. Dickerson.

21291. Lundqvist, A. (*Inst. Genetics, Lund, Sweden.*) On self-sterility and inbreeding effect in tetraploid rye. *Hereditas* 33(4): 570-571. 1947.—A tetraploid strain of autumn rye has shown the marked self-sterility of the diploid var. from which it was raised, but the incompatibility is clearly weakened. The proportion of individuals in the class with the lowest self-fertility (0-5%) has especially decreased. On the other hand, highly fertile individuals have not been found in the tetraploids. The degenerating effect of inbreeding has been studied in a limited I<sub>1</sub> generation consisting of 25 lines in the diploids, 32 in the tetraploids. It is considerable also in the tetraploids but almost in each tested character less marked than in the diploids, although in some cases the differences are but slightly significant.—A. Lundqvist.

21292. Rudolf, W. A importância da hibridação intra-e inter-generica no melhoramento das plantas cultivadas. [The importance of intra- and inter-generic hybridization on the breeding of cultivated plants.] *Agronomia Lusitana* 6(4): 333-347. 1944.—Results from work carried out at Müncheberg on wheat, potato, fruit trees, etc., stress the role of intra- and inter-generic hybridization in the breeding of cultivated plants. The wild spp. of cultivated plants are of great importance as the starting point for the selection of resistant vars. Since many undesirable wild characteristics are transmitted to the hybrids, the wild spp. may be used for breeding purposes only when the races of cultivated plants do not bear the desired resistant factors. As a rule wild spp.

are not resistant on the whole but they contain resistant races more frequently than cultivated spp. Therefore, it is also necessary to select from the wild spp., races which may be used as the starting point for breeding. For each case it is necessary to work out the cytogenetic basis towards a proper use of the wild spp. If in the spp. to be crossed there are no homologous sets of chromosomes, polyploidization before or after hybridization assists greatly in obtaining fertile hybrids. Single or double back-crosses will greatly assist in obtaining the combination of high yields and quality of cultivated vars., with the resistance of the wild spp., whenever the selection has these characteristics in view. After testing the resistance of the hybrids for 2 to 3 yrs. it may be expedient not to back-cross in all generations with the parental cultivated vars. This holds true at least for the annual and biennial spp. Only cultivated vars. better adapted for eliminating undesirable characteristics of the wild spp. (e.g., tomato vars. with large and fleshy fruits) must be selected for back-crossing. Even with spp. with generations lasting from 1 to 15 yrs. (fruit and forest spp.), interspecific hybridization leads relatively quickly to the desired goal.

#### ANIMAL (EXCEPT MAN)

21293. Belic, Milan. *Zwillingen- und Drillingsuntersuchungen beim Rind unter besonderer Berücksichtigung der Skelettvariabilität. Zeitschr. Zücht. Reihe B: Tierzücht. u. Züchtungsbiol.* 49: 10-96. 46 fig. 1941.—A study of twins and triplets of cattle with special regard to variability of the skeleton. After introductory remarks concerning the history and the importance of twin research, the author reviews the literature on twins with special regard to cattle. Three pairs of monozygotic twins and a monozygotic triplet group were investigated. No dizygotic twins were available for comparison. 301 measurements on 44 bones per skeleton were made. The results are extensively tabulated. There are some differences in the variability of the different characteristics.—G. Östergren.

21294. Dickerson, G. E. (Region. Swine Breeding Lab., Ames, Iowa), and J. W. Gowen. (Iowa State Coll., Ames.) Hereditary obesity and efficient food utilization in mice. *Science* 105(2732): 496-498. 2 fig. 1947.—Yellow and black agouti segregates were obtained by crossing yellow ♂♂ with albino ♀♀. The yellow and black littermates of the same sex differed in the one chromosome or part thereof which carried the "yellow" gene. Sets of unmated yellow and black littermates were compared within each sex and growth period. The mice were self-fed in individual cages. The only food was a complete ground ration. Food loss was prevented and excretions were recovered. Live wt. gains, food consumption, and feces production were obtained by 10-day periods from 30 to 50 days and then by 20-day periods. Each mouse was chloroformed and its body analyzed for fat, N, water and total dry matter. Body composition was also obtained for yellow and black mice from 2 litters within each sex at 25 days of age. From 25 to 35 or 40 days of age, yellow and black mice of the same sex were nearly alike in gain and food consumption, and the gain was chiefly protein. After 40 days, yellow mice of both sexes exceeded the black littermates greatly in gains but moderately in food consumption. The extra gain of the yellow mice was entirely fat tissue. The "yellow" gene greatly increases the energy stored per gm. of gain but sharply reduces the food required per gm. The yellow gene accomplished increased fat deposition and lowered food requirements per unit of gain by increasing the appetite and reducing the energy expended in body work, beginning at 35 or 40 days of age. The percentage of food calories eliminated in feces was about 19 in the 25- to 30-day period to about 23 in the 25- to 300-day period. It was slightly lower for black ♀♀. The increase in nutrients absorbed by yellow, as compared with black mice, was nearly in proportion to the increase in food consumption. The increase in energy for body work by the yellow mice was proportionally much less than the increase in their avg. body wt., particularly in ♀♀. The data emphasize how little of the food energy is stored compared with that used for maintenance and activity. Energy stored as fat and protein represented 2-11% of the total food energy during the several periods from 25 to 300 days of age, whereas energy for body work represented 70-80%. Of the total calories consumed, the yellow mice stored 2-5% more than the black littermates

and used at least that much less for maintenance and activity. A small reduction in maintenance food caused a large increase in food stored. There is evidence that the action of the yellow gene is similar to that of the genes affecting fat deposition in animals generally.—H. M. Kaplan.

21295. Douglass, Patricia, and W. L. Russell. (Jackson Mem. Lab., Bar Harbor, Me.) A histological study of eye abnormalities in the C57 black strain of mice. *Anat. Rec.* 97(3): 414. 1947.—An abstract.

21296. Fraser, F. Clarke. (McGill U., Montreal, Canada.) The effect of oral administration of vitamin A on the expression of the recessive gene "rhino" in the mouse. *Anat. Rec.* 97(3): 415. 1947.—An abstract.

21297. Hall, Calvin S. (Western Reserve U., Cleveland, Ohio.) Genetic differences in fatal audiogenic seizures between 2 inbred strains of house mice. *Jour. Heredity* 38(1): 3-6. 4 fig. 1947.—Two inbred strains of mice, *dba* and C57, differ markedly in their susceptibility to audiogenic seizure. A large proportion of the *dba* strain convulse and die. Audiogenic seizures are rarely observed in C57 mice.—*Auth. summ.*

21298. Herskowitz, Irwin H. (Columbia U., N. Y. C.) A new method of treating *Drosophila* gametes with chemicals. *Evolution* [New York] 1: 111-112. 1947.—A vaginal injn. of soln. of the mutagenic chemical methyl bis (β-chlorethyl) amine hydrochloride in ♀♀ of *D. melanogaster* resulted in a significantly increased yield of mutants among the offspring.—E. Mayr.

21299. Hovanitz, W. (U. Michigan, Ann Arbor.) Occurrence of parallel series of associated physiological and morphological characters in diverse groups of mosquitoes and other insects. *Contr. Lab. Vertebrate Biol. Univ. Michigan* 32: 1-24. 1947.—The association of several characters has been shown to occur in discrete species groups of mosquitoes, *Drosophila*, and Lepidoptera. These characters vary in a parallel fashion among the members of the groups. The characters shown to be associated are various qualities of (A) development rate, (B) activity of adults, (C) mating habits, (D) ecological distribution, (E) coloration, (F) larval food tolerance, (G) salt tolerance, (H) adult feeding preference, and (I) morphological characteristics. The physiological characters mentioned (A-H) seem to be related to speed of body metabolism. The morphological characteristics (I) are concerned with body proportions and extent of manifestation of hair, chaetae, and spine characters. The parallel variation exhibited by the several taxonomic groups is of the following sort: if the development rate is rapid, the adult activity is great, the adults will mate in small space, the insect prefers a hotter and dryer environment in which to live, its colors are lighter, the larval food and salt solution tolerances are greater, the adults (in mosquitoes) will feed on man, and there is an increase in extent of manifestation of the particular morphological characters concerned. Many of the associations and parallel variations seem to be pleiotropic (manifest) effects in development. The genes concerned are probably metabolic rate genes, each having pleiotropic effects and together having an additive influence on each character. It appears probable that one or more of the associated characters are advantageous to a given form in its specific environment, though no direct evidence of selection is now available for most of these characters. The other associated characters then may either be evolved in a parallel fashion due to parallel selection or they may be pleiotropic effects.—William Hovanitz.

21300. Lehmann-Mathildenhöh, Ernst von. Beitrag zur Vererbung weissgeborener Pferde. *Zeitschr. Zücht. Reihe B: Tierzücht. u. Züchtungsbiol.* 49: 191-195. 2 fig. 1941.—The author has found a dominant factor for congenital white in horses. Wriedt's suggestion of recessive inheritance is criticized. The white factor can also be present in mottled and intermediary piebald horses.—G. Östergren.

21301. Little, C. C., and K. P. Hummel. (Jackson Mem. Lab., Bar Harbor, Me.) A reverse mutation to a "remote" allele in the house mouse. *Proc. Nation. Acad. Sci. U. S. A.* 33(2): 42-43. 1947.—In the agouti series of alleles, *A<sup>y</sup>*, *A<sup>w</sup>*, *A*, *a<sup>1</sup>* and *a*, a mating of 2 dilute brown (*dba*) individuals produced 18 *aa*, and 3 mutant light belly *A<sup>w</sup>a* individuals. In other matings with the same ♂ but unrelated *aa* ♀♀, 43 young were all non-agouti (*aa*). The mutation apparently "skipped" 2 genes (*a<sup>1</sup>* and *A*) epistatic to *a* in order to reach the *A<sup>w</sup>* allele. It is argued that the frequency



of appearance suggests a very early division of the gonad of the mutating parent into "A<sup>w</sup>" and "aa" bearing cells, or there is a remote possibility of a hypothetical gene which when contributed by both parents causes a mutation from a to A<sup>w</sup>. The authors conclude that the occurrence of the mutation makes a truly multiple allelomorphic series more probable than close linkage of A<sup>w</sup> with the agouti locus.—G. W. Lasker.

21302. Lodemann, G. Zur Frage der Auswertung von Milchleistungsprüfungsergebnissen. *Zeitschr. Zücht. Reihe B: Tierzücht. u. Züchtungsbiol.* 49: 180-190. 5 fig. 1941.—A scheme of representing descents in cattle is suggested in which the inheritance of milk productivity easily can be followed. Emphasis is put on making it so simple that it can be understood by any farmer. The errors and possible corrections of the system are discussed. An example and a preliminary genetic analysis are given.—G. Östergren.

21303. Murray, W. S., and S. G. Warner. (Roswell Park Mem. Inst., Buffalo, N. Y.) Segregation of mammary cancer to no mammary cancer in the Marsh albino strain of mice. *Jour. Natl. Cancer Inst.* 7(4): 183-188. 1947.—Progressive decrease in tumor incidence in the Marsh-albino mouse had been attributed to segregation and expansion within the home colony of a family or families none of the members of which developed mammary tumor. In an effort to determine whether or not this segregation is characteristic of the Marsh strain, a system of single-pair matings was followed to obtain a family that developed tumors in percentages comparable with those first reported for the stock. Such a family was later expanded in a study of possible recurrence of segregation to noncancer. The present paper reports such a recurrence. At beginning of these expts., the Marsh strain had reached theoretical homozygosity. Changes in % of tumor incidence in later generations are explained on the basis of change in the mammary-tumor inciter rather than on genetic mutation affecting the physiology of the host. This change in inciter potency is apparently effected between ingestion of the mother's milk and the time when the host ♀ would ordinarily develop tumor. There seems to be positive correlation between effectiveness of the stimulus and % of tumor produced, with occasional sharp changes in the direction of no tumor. It is therefore concluded that the decrease in tumor production in this stock is due to the cumulative effect of such sharp reductions in inciter effectiveness.—Marjorie Fryckberg.

21304. Taylor, Lewis W., and C. A. Gunns. (U. California, Berkeley.) Diplopodia: A lethal form of polydactyly in chickens. *Jour. Heredity* 38(3): 67-76. 6 fig. 1947.—Polydactylous chicks, characterized by partial doubling, possibly reduplication, of metatarsals and digits of the feet and of metacarpals and digits of the wings, are described. Associated defects include shortening and curvature of long bones of leg and wing, and a short maxilla. The mutant is a simple autosomal recessive, suppressed in some cases by environmental or other genetic factors. Only one abnormal chick was reared, 98% of chicks having died in shell. This natural form bears close resemblance to Gabriel's (1946) experimentally produced polydactyly.—L. W. Taylor.

21305. Terrill, Clair E. (U. S. Sheep Expt. Sta., Dubois, Idaho.) Color on the legs of sheep. *Jour. Heredity* 38(3): 89-92. 1947.—The inheritance of brown or black color on the legs was studied on 1517 Columbia and 1051 Targhee weanling lambs born from 1941 to 1945, and their dams. The degree of color on the legs was scored from 1 to 5. Lambs having no color were scored as 1 and those with almost completely colored legs were scored as 5. 12% of Columbia lambs and 15% of Targhee lambs had leg color. The % of dams with color was higher in each breed. This indicates that little selection against color has been practiced in ewes, but that some progress has been made in eliminating color through selection of the sires. Leg color appears to be recessive because many lambs with color are from parents without color. However, when both parents had color <1/2 of the offspring had color, indicating that >1 pair of genes are involved. Heritability of leg color was estimated from intra-sire regressions of offspring on dam and from half-sib correlations. The latter gave lower estimates, probably because the sires had been selected for absence of color. Estimates of heritability from intra-sire regressions of offspring on dam were  $0.26 \pm 0.05$  and  $0.34 \pm 0.07$  for Columbias and Targhees, respectively.

These estimates are consistent with progress which has been made from selection. Further progress toward eliminating leg color will be slow because its incidence is already low. Culling of all sheep with color would reduce the % of lambs with color to about 7 in Columbias and 12 in Targhees.—Auth. abst.

21306. Whiting, P. W. (U. Pennsylvania, Philadelphia, Pa.) Some experiments with *Melittobia* and other wasps. *Jour. Heredity* 38(1): 11-20. 4 fig. 1947.—Wasps of the chalcidoid genus *Melittobia* are very different from the ichneumonoid *Habrobracon* in habits, life history and sex ratio. Despite the fact that they are naturally close-crossed, ♀ ratio is very high and no 2n ♂♂ are found. By egg count studies it has been shown for the first time that, in this genus at least, the *Habrobracon* system of sex determination with multiple alleles cannot apply. Comparative studies of representative members of different groups of Hymenoptera suggest that while all exhibit haploidy and multiple sex-allelism may possibly characterize the order in general, the close-crossed species have adopted some other method of reproductive economy.—Auth. abst.

# MAN

21307. Alvord, Rex M. (Stanford U. Sch. Med., Calif.) Zygodactyly and associated variations in a Utah family. *Jour. Heredity* 38(2): 49-53. 2 fig. 1947.—Two family pedigrees are presented. One, in which some 350 descendants have been traced, shows an exceptional distribution of polydactyly, zygodactyly and syndactyly. In the zygodactyl hands of this family there is the usual union between digits III-IV, but in the feet instead of being between digits II-III as in the other family and most cases reported in the literature, the union is between digits III-IV or, in a few cases, between IV-V or V-VI. The 3 types of abnormality seem to be genetically interchangeable rather than due to the chance conjunction of 3 independent mutations. It seems unlikely, however, that the gene for zygodactyly is the same in the 2 families, although it is recognized that the effects of one or more main genes may be influenced by modifying genes of undetd. incidence. In the larger of these families the traits are transmitted by affected ♂♂, or even in 2 instances by unaffected ♀♀, but in no case have appeared among the many descendants of affected ♀♀. Considerable plasticity in the developing digits is indicated but, more than that, it seems probable that entirely different genes may influence developmental processes in a similar manner.—C. H. Danforth.

21308. Barcroft, H., Q. H. Gibson, D. C. Harrison, and J. McMurray. (Queen's U., Belfast, Ireland.) Familial idiopathic methemoglobinemia and its treatment with ascorbic acid. *Clin. Sci. [London]* 5: 145-157. 1945.—In this study of 2 brothers suffering from familial idiopathic methemoglobinemia, the blood changes in one were followed during successful treatment with ascorbic acid. The cyanosis was relieved and the methemoglobin (I) fell from 7.3 to 0.8 g. per 100 ml. blood. Continued treatment with ascorbic acid (200-300 mg. per day) has kept I at a low level for nearly 2 yrs. In vitro ascorbic acid reduced I in the patient's red cells to normal hemoglobin. The enzyme systems in the erythrocytes of the 2 patients reduced I in the presence of added glucose or lactate much more slowly than did those in normal red cells. The main features of the few cases of idiopathic methemoglobinemia hitherto reported are summarized. The mode of action of ascorbic acid in relieving the symptoms, and the etiology of the disease are discussed.—Ruth Berggren (courtesy Chem. Absts.).

21309. Bogaert, M. R. A. L'anomalie familiale nucléaire des leucocytes de Pelger-Huët. *Sang* 17(8): 502-509. 1946.—Hematological data are reported from a family in which 5 members showed the Pelger-Huët type of leukocytes. The trait was transmitted as a dominant factor.—R. Isaacs.

21310. Dobzhansky, Th. (Columbia U., N. Y. C.), and M. F. Ashley Montagu. (Hahnemann Med. Coll., Philadelphia, Pa.) Natural selection and the mental capacities of mankind. *Science* 105(2736): 587-590. 1947.—There can be no genuine clarity in the understanding of man's biol. nature until the role of the social factor in his development is understood. For rational systems of evolution it is necessary to look to those which consider progressive adaptation the driving force of the process. Man's adaptation consists



chiefly in developing his inventiveness. For any trait, its fixity or plasticity is genetically controlled and the direction of the evolutionary adaptation will depend on circumstances. First, the change is always detd. by the nature of the supply of mutational variability available. Secondly, the direction of the change is controlled by natural selection. Human social environments are notable for their complexity and also for the rapid changes to which immediate adjustment is demanded. Adjustment occurs chiefly in the psychical realm. Genetic fixation of behavioral traits would have been unfavorable for survival. The genetically controlled plasticity of mental traits is the most typical and unique human characteristic. The cultural evidence suggests that the essentially human organization of the mental capacities emerged early in human evolution. It is probable in view of the diff. environments of men that significant genetic diffs. in the mental capacities of the various ethnic groups of mankind exist.—*H. M. Kaplan.*

21311. Falconer, D. S. Sensory thresholds for solutions of phenyl-thio-carbamide. *Ann. Eugenics* 13: 211-222. 1947.—Data on the threshold sensitivity for phenyl-thio-carbamide (P.T.C.), which were collected by R. A. Fisher at the Galton Laboratory, are presented and analyzed. The conc. of P.T.C. which has the minimum frequency of thresholds was 50 ppm. This conc. was therefore used to separate tasters from non-tasters. 25.9% of ♂♂ and 22.2% of ♀♀ were non-tasters. A small positive correlation was found between sensitivity to P.T.C. and sensitivity to quinine. The cause of this was probably psychological rather than physiological. There was, however, a significant sex-difference in sensitivity to quinine, women having lower thresholds than men, as with P.T.C. Study of the published data on the distribution of thresholds for P.T.C. shows that American, Danish and British populations differ not only in the proportion of non-tasters, but also in the concentration of P.T.C. which most accurately separates tasters from non-tasters. Tests made with single solns. on different populations are therefore not strictly comparable in respect of the observed frequency of tasters and non-tasters.—*D. S. Falconer.*

21312. Fisher, R. A. Note on the calculation of the frequencies of Rhesus allelomorphs. *Ann. Eugenics* 13: 223-224. 1947.

21313. Haldane, J. B. S. The mutation rate of the gene for haemophilia, and its segregation ratios in males and females. *Ann. Eugenics* 13: 262-271. 1947.—Andreasen's data on hemophilia give the following results: The mean mutation rate to hemophilia per chromosome per generation is  $3.2 \times 10^{-5}$ , somewhat higher than the value of  $1.9 \times 10^{-5}$  calculated by him. The mutation rate is much higher, and possibly 10 times higher, in ♂ than in ♀ chromosomes. Combining his data with those of Birch, 31 + 1 doubtful out of 69 sons of the daughters of hemophiles were themselves

hemophilic, and  $52.7 \pm 5.9\%$  of the sisters of hemophiles were heterozygous.—*J. B. S. Haldane.*

21314. Macklin, Madge T. (Ohio State U., Columbus.) Failure of the theory of partial sex-linkage to explain known facts of inheritance of xeroderma pigmentosum. *Anat. Rec.* 97(3): 397-398. 1947.—An abstract.

21315. Race, R. R. (Inst. Prevent. Med., London, England.) The Rh blood groups. *Schweiz. Med. Wochenschr.* 76(37/38): 921-925. 1946.—Although brief mention is made of the brilliant pioneer researches of Levine, Landsteiner, and Wiener on the Rh blood groups and their important clinical associations, this paper is mainly concerned with the ideas of R. A. Fisher relating to the manner of inheritance of the Rh genes. The British work of 1943 resulted in the isolation of 7 heritable forms of Rh. It was generally thought that these forms depended on 7 allelomorphs at one locus. Fisher however, studying the results, noticed certain relationships which strongly suggested that 3 loci were involved, each locus having 2 allelomorphs. This theory predicted the existence of 2 more Rh antibodies and an 8th form of Rh. One of these antibodies has since been found, giving exactly the foreseen reactions. Successful prediction such as this must be rare in biology. The synthesis of Fisher has brought order into the chaos. Rh genes, antigens and antibodies can be indicated in tabular form thus:

Genes (not yet found) on the Rh		
Antibodies	chromosome	Antibodies
anti-C .....	C or c .....	anti-c
anti-D .....	D or (d) .....	(anti-d <sup>2</sup> )
anti-E .....	E or e .....	anti-e.
— <i>Auth. summ.</i>		

21316. Sawyer, James E. H. A myopathic family. *Ann. Eugenics* 13: 225-227. 1947.—Discusses a large family in which there are 13 cases of muscular dystrophy similar to the scapulo-humeral type, as described by Brb. The pedigree has been carefully worked out.—*J. E. H. Sawyer.*

21317. Videbaek, Aage. (U. Inst. for Human Genetics, Copenhagen, Denmark.) Familial leukemia. A preliminary report. *Acta Med. Scand.* 127(1/2): 26-52. 1 fig. 1947.—The author has reviewed extensively the literature on leukemia (long bibliography). He groups the publications as: 1) Doubtful cases or incomplete reports of familial leukemia; 2) unquestionable cases of familial leukemia. Annotations are made on all the cases cited. To the instances recorded he adds 11 cases from his own observation with detailed case reports. He presents a schematic representation of familial leukemia based on 37 cases, 26 taken from the literature and 11 of his own. He concludes that the records of familial leukemia have grown so numerous that one cannot rule out factors of heredity as contributory causes of the disease.

## BIOMETRY

JOHN W. GOWEN, *Editor*

(See also Entries 21312, 21341, 21459, 21466, 21501, 21544, 21571, 21585, 21642, 21670, 21685, 21734, 21781, 21833, 21843, 22001, 22002, 22053, 22059, 22074, 22128, 22129, 22166, 22179, 22193, 22231, 22273, 22313, 22317, 22318, 22321, 22367, 22377, 22493, 22533, 22569, 22760, 23228, 23263, 23447)

21318. Allen, Edward S. Six-place tables. 7th ed. xxiii + 232 p. McGraw-Hill Book Co.: New York, 1947. Pr. \$2.50.—This pocket-size volume of 6-place tables is conveniently indexed for ready use. This edition has an expansion of the tables of natural logarithms and of exponential and hyperbolic functions to 6-place accuracy. A short introduction gives the main points covering the use of the tables. The tables include squares, cubes, square roots, etc., 5th powers and 5th roots, circumferences and areas of circles, common logarithms of numbers, common logarithms of sines, cosines, tangents, cotangents, natural trigonometric functions, radians and degrees, functions of radians, logarithms of factorials, natural logarithms of numbers, exponential, hyperbolic and  $\gamma$  functions, probability integrals, trigonometric formulae, integrals, and mathematical constants. Tabulation is clear.—*J. W. Gowen.*

21319. Kosambi, D. D. An extension of the least-squares method for statistical estimation. *Ann. Eugenics* 13: 257-261. 1947.—The ordinary least-squares method of

estimation (used only for linear equations), amounts to minimizing the sum of squared distances from a point to be determined thereby to a set of planes in hyperspace. An extension to non-linear equations, using the same principle, is suggested and illustrated by means of an application to the determination of blood gene-ratios. The particular example is primarily of use only as an illustration. The data submitted are of some interest in that they suggest the relationship between blood gene A and cancer, particularly cancer of ♀♀ in one group of sites, namely corpus, uterus, cervix, and ovary.—*D. D. Kosambi.*

21320. Mather, K. (John Innes Hort. Inst., London, Eng.) Statistical analysis in biology. [With a foreword by R. A. Fisher.] 2nd ed. 267p. Interscience Publishers, Inc.: New York, 1946. Pr. \$5.—The 2d edition of this book is distinctly superior to the 1st in having better paper and press work. A new chapter has been added to fill the need for angular and probit transformations in such work as toxicological and biological assays. Misprints and ambiguities of the first

volume have been largely cleared up in the present edition. The volume is designed for the exptl. biologist. It deals with the data of populations and expts., their probabilities and significances, and methods of obtaining information from them. Specifically, the constants discussed are means, standard deviations, skewness and kurtosis, normal deviates,  $t$  and  $z$  and Chi-square distributions, and the interrelation and use of these distributions. Analysis of variance leads to a discussion of planning of expts. and the interpretation of variation in 2 or more variables, under the titles of polynomial or multiple regressions and correlations. The methods of maximum likelihood and transformation of data form the last 2 chapters. A glossary of terms and tables to facilitate the use of the different constants completes the book.—*J. W. Gowen.*

21321. Mitchell, R. L., R. O. Scott, and V. C. Farmer. Background correction in spectrographic analysis. *Nature [London]* 157: 193. 1946.—A simplification of the method of correction using subtraction logarithms when detn. is made by the internal standard method. Specially compiled tables are referred to.—*A. M. (courtesy Soils and Fertilizers).*

21322. Penrose, L. S. Some notes on discrimination. *Ann. Eugenics* 13: 228-237. 1947.—A method is described of simplifying the problem of discriminating 2 classes of objects, which differ in respect of a large number of characters. The number of characters is reduced to 2 by using the compound measurements 'size' and 'shape'. In the hypothetical case, where the original characters are all equally correlated with one another, this method is efficient because size and shape are uncorrelated. In practice, many types of data conform fairly closely to this model. In some cases even simpler methods can be tried. When the variances of the distributions of measurements of one character differ in 2 populations, the degree of discrimination can be maximized by taking the squares of measurements from a specified point on the scale. In this way, differences in variance in the 2 populations contribute to the discrimination.—*L. S. Penrose.*

21323. Smith, Cedric A. B. Some examples of discrimination. *Ann. Eugenics* 13: 272-282. 1947.—From a new way of looking at the question of discrimination between 2 populations, we see that the best discriminant function is the difference between the logarithms of the two distribution functions, in agreement with a result of Welch's. For discrimination between 2 normal distributions, this gives in general a quadratic function, the equations for which are set out in full. In certain special cases this takes a simple form. For example, when the variances and covariances are the same in the 2 distributions, we get Fisher's linear discriminant. This theory may be usefully combined with Penrose's theory of 'size' and 'shape', and 2 numerical examples of its application to expts. are given, where the 'size' and 'shape' values have been already calculated. In these 2 examples, the linear discriminants have been worked out for comparison with the quadratic one.—*C. A. B. Smith.*

21324. Staff of the Computation Laboratory. A manual of operation for the automatic sequence controlled calculator. [With a foreword by James Bryant Conant.] 561p. Illus. Harvard U. Press: Cambridge, Mass. 1946. Pr. \$10.

21325. Wald, Abraham. Sequential analysis. xii+212p.

John Wiley and Sons, Inc.: New York, 1947. Pr. \$4.—This volume is the first book-length treatment of the sequential probability ratio test. This test has one advantage over certain other tests in that it tends to control possible errors committed by a wrong decision. The material is presented in 3 parts and an Appendix. Part I contains a discussion of the general theory of the sequential probability ratio test. Part II discusses applications of the general theory given in Part I. Part III outlines an approach to the problem of sequential multi-valued decisions and estimations. Mathematical derivations of intricate nature are relegated to the Appendix. The material is presented in 11 chapters. The 1st chapter deals with current theory of testing statistical hypotheses. The 2d develops the reasoning behind the sequential test of a statistical hypothesis. The 3d presents a discussion of the sequential probability ratio and illustrates its use in testing a simple hypothesis against the single alternative hypothesis. The 4th chapter outlines a theory of sequential tests of simple and composite hypotheses against a set of alternatives. The 2d part begins with chapter 5 with testing the mean of a binomial distribution. The 6th chapter presents the test of the difference between the means of 2 binomial distributions. Chapters 7, 8, and 9 present the testing of more complex hypotheses. Part III begins with chapter 10, where the choice of a hypothesis from a set of mutually exclusive hypotheses is discussed. Chapter 11 sets out some of the problems of sequential estimation. The Appendix presents various proofs necessary to the sequential probability ratio test.—*J. W. Gowen.*

21326. Worthing, Archie G., and Joseph Geffner. Treatment of experimental data. ix+344p. 2 fig. John Wiley and Sons, Inc.: New York, 1946.—During the course of years the senior author has frequently encountered tables of unsmoothed values, tables with poor or no descriptive legends, graphs with poorly chosen coordinates, discussions of data with obvious lack of understanding or ability to express and apply precise reasoning in interpreting them. This book is an outgrowth of a course designed to equip the student to meet these conditions. The material is primarily for the physicist, chemist and engineer. The discussion is presented in 13 chapters and an Appendix. The first 3 chapters cover the presentation of data by tables, by graphs, and by equations. The 4th chapter deals with tabulation and graphical differentiation and integration. A discussion of the Fourier series is presented in the 5th chapter. The 6th and 7th chapters deal with normal frequency distributions, the 8th with means and precision indexes of unequally weighted measurements. The 9th chapter discusses cases involving the sum or difference, product or quotient, multiple constants and constant powers, etc., and the use of the law of propagation of precision indexes in planning a precision expt. The 10th chapter illustrates the adjustment of conditioned measurements, and the 11th, least-squares equations representing observed data. The 12th and 13th chapters deal with correlation and nonharmonic periodic functions. The Appendix contains a discussion of determinant methods and tables necessary to facilitate the uses of this volume. The short series of problems following each chapter enables the student to test his understanding of the foregoing material.—*J. W. Gowen.*

## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 22506, 22507, 22508, 22511, 22512, 22960, 22961, 22963)

### MICROSCOPY AND TECHNIQUE

21327. Albertini, A. von. Zur Anwendung der Phasenkontrastmikroskopie in der pathologischen Histologie. *Schweiz. Zeitschr. Path. u. Bakt.* 8: 298-310. 43 fig. 1945.—Numerous beautiful photomicrographs illustrate the possibilities of applying the phase-contrast microscope (PCM) in pathological histology. The author's collaborator (Dr. G. F. Hoessly) made mica chambers with quadrangular cuttings, thus obtaining a depth of the chamber of about 40  $\mu$ . The chamber must be closed with a very thin coverslip, since most of the examinations were carried out with oil immersion. Parallel studies were made with the usual histological staining methods in order to interpret the results given by the PCM.

The latter renders excellent services for the histology of tumors and is extremely suitable for fresh preps. of "surviving" cells, especially when suspended in Tyrode soln. With the PCM, cytological diagnosis of tumors appears to be possible while in differential diagnosis it is applicable only with some restriction. On the other hand the PCM promises new advances in oncology.—*H. Simons.*

21328. Cable, R. M. (Purdue U., Lafayette, Ind.) Damar as a mounting medium. *Turtos News* 25(6) 105-106. 1947.—Method for preparing damar resin in quantity is given with suggestions for avoiding or rectifying certain disadvantages in its use. When these disadvantages are overcome, damar is superior to balsam.—*R. W. Dexter.*

21329. Gordon, Harold. (*Nichols V. A. Hosp., Louisville, Ky.*) A simple micro-projector. *Amer. Jour. Clin. Path.* 17(5): 422-423. 2 fig. 1947.—Tissue slides can be projected by means of a 300-watt mercury vapor-incandescent tungsten electrode light manufactured by General Electric Co., housed in a unit manufactured by Bausch and Lomb Optical Co. A translucent screen of tracing paper tightly stretched over a wooden frame is recommended. The operator stands proximal to the screen, the audience distal to the screen.—Harold Gordon.

#### LABORATORY APPARATUS AND TECHNIQUE

21330. Anonymous. Concentrated arc-lamp. *Indust. Equip. News* 15(4): 1. 1 fig. 1947.—Provides point source of illumination. Employs permanent electrodes sealed inside a glass bulb filled with inert gas. Source: Western Union Telegraph Co., Water St., Water Mill, L. I., N. Y.—M. A. Raines.

21331. Anonymous. Miniature photoelectric tube. *Indust. Equip. News* 15(4): 21. 1947.—Measures  $\frac{1}{4}$  in. in diam. at its largest end by  $1\frac{13}{32}$  in. in overall length. It is actuated by light entering a tiny window at the large end. Source: Radio Corp. of America, 1941 Front & Cooper Sts., Camden, N. J.—M. A. Raines.

21332. Anonymous. Midget microphone. *Indust. Equip. News* 15(4): 47. 1 fig. 1947.—Designed to study sound intensities. A condenser microphone. Response is about minus 59 db. referred to 1 volt per dyne per square centimeter when used with a suitable preamplifier. The response is also flat to within 1 db. from 100 to 7,000 cycles and within 3 db. from 60 to 10,000 cycles. Can be employed to measure acoustic intensities of 1,200 to 1,400 dynes per square centimeter. Source: Kellogg Switchboard & Supply Co., 6648-52 S. Cicero Ave., Chicago 38, Ill.—M. A. Raines.

21333. Anonymous. Portable pH meter. *Indust. Equip. News* 15(6): 8. 1 fig. 1947.—Reads 0 to 14 pH. Readings are made direct on a scale graduated in 0.2 pH divisions. A resistance thermometer provides automatic temp. compensation in a range between 0 and 100°C. Connects into a 110-volt 50/60 cycle ac power source; is compensated for line variation between 100 and 130 volts. Weight is about 10 pounds. Designed to stand up under only ordinary care such as under use by the regular workers in a plant. Source: Cambridge Instrument Co., 3710 Grand Central Terminal, New York 17, N. Y.—M. A. Raines.

21334. Anonymous. Miniature speed reducer. *Indust. Equip. News* 15(6): 15. 1 fig. 1947.—The housing measures only about  $2\frac{1}{2}$  inches in length by  $1\frac{1}{2}$  inches high. Speeds to 20,000 rpm., torque to 2 in. lb., ratios of 1.1 to 15 to 1 are available in speed increasing or reducing direction. Source:

Metron Instrument Co., 430-34 Lincoln St., Denver 9, Colo.—M. A. Raines.

21335. Anonymous. Electric heating mantle. *Indust. Equip. News* 15(6): 40. 1 fig. 1947.—For laboratory flasks, 1 to 72 liters. Resistance wire which does not operate above a black heat is faced with glass fabric on the interior of this new heating mantle. The exterior is an aluminum shell. Source: Glas-Col. Apparatus Co., 1702 S. 7th St., Terre Haute, Ind.—M. A. Raines.

21336. Anonymous. Refractometer. *Indust. Equip. News* 15(6): 46. 1 fig. 1947.—For obtaining refractive indices of liquids. Unit applies on the stage of a microscope; mounts 2 prisms of different refractive indices in a metal base equipped with connections for water cooling. Microscope measures distance between 2 lines which are refractions of a single line engraved on the glass base beneath the prisms. The 2 lines are produced from the one by the difference in the refractive indices of the prisms and of the sample in the cell. Source: Arthur H. Thomas Co., 230 S. Seventh St., Philadelphia 5, Pa.—M. A. Raines.

21337. Anonymous. Air velocity meter. *Indust. Equip. News* 15(6): 61. 1 fig. 1947.—Is actuated by a pick-up element combining a hot-wire and thermopile principle. Rate of 50 fpm. is about 20% of full scale, which reads 2,000 fpm. Accurate readings at rates as low as 5 fpm. can be obtained consistently with the instrument. Source: Hastings Instrument Co., P. O. Box 1275N, Hampton, Va.—M. A. Raines.

21338. Anonymous. Geiger counter. *Indust. Equip. News* 15(6): 75. 1 fig. 1947.—A portable, battery-operated outfit, for checking radioactivity. Overall dimensions,  $12\frac{1}{4}$  by  $4\frac{1}{4}$  by  $11\frac{3}{4}$  inches; wt. with batteries, 17 lb. Source: North American Philips Co., 100 E. 42nd St., 4th floor, New York 17, N. Y.—M. A. Raines.

21339. Anonymous. Static eliminator. *Indust. Equip. News* 15(6): 90. 1947.—A radioactive strip on a shielded bar which produces ionization of the air in the non-shielded area for a distance of 3 in. from the bar. Is available in a range of lengths to meet given requirements. Radioactive strength is essentially permanent. Source: U. S. Radium Corp., 533-37 Pearl St., New York 7, N. Y.—M. A. Raines.

#### PHOTOGRAPHY

21340. Kingma Boltjes, T. Y. (*U. Amsterdam, Holland.*) Some remarks on microphotography. *Antonie van Leeuwenhoek Jour. Microbiol. and Serol. Jubilee Vol. Albert J. Kluyver* 12(1/4): 232-242. 2 pl. 1947.—Photographs are made with u.-v. light of  $\lambda$  363 m $\mu$ . Although the lenses are not corrected for this wave length, its use means a real improvement. The influence of the condensor on the resolving power of the microscope is discussed.—M. P. Löhns.



## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Weight reduction of obese women of college age, 21704, 21722; Body adaptations to change in diet, 21707; Congenital defects resulting from rubella in pregnancy, 22094; Birth weights of psychiatric patients, 22386; Dental caries in anthropoids, 23014; Evolution of dentition in primates, 23916)

21341. Burt, Cyril, and Charlotte Bans. A factor analysis of body measurements for British adult males. *Ann. Eugenics* 13: 238-256. 1947.—Measurements have been obtained for 9 physical traits from 2,400 adult ♂♂ aged 17-38, and the correlations have been factorized by the methods devised by one of the authors for dealing with mental measurements. With these large numbers it has been possible to calculate the factor saturations separately for 8 age-groups: the factor patterns have been found to be remarkably constant from yr. to yr. Contrary to the statements of Spearman and Thomson, the results show that the contributions of the several factors to the total variance are much the same for physical traits as for mental traits. With physical as with mental, the most conspicuous factor is the first or 'general factor' which contributes >50% to the total variance. This appears to be a factor for general body size. The 2d factor is a bipolar factor contributing about 13% to the total variance. This classifies traits into (a) longitudinal and (b) transverse or circumferential and, provided the term 'type' is interpreted as meaning a patterned tendency, confirms the traditional distinction between leptosomic and pachysomic types of body build. The bipolar tendency can be assessed for various persons by means of a partial regression equation and the distribution of the factor measurements so obtained exhibits a close approximation to the normal curve.—*Cyril Burt*.

21342. Chaudhuri, N. M. Were the Rigvedic Aryans Proto-Nordics? *Sci. and Culture* 12(2): 64-69. 1946.—The generally accepted view that the Rigvedic Aryan invaders of India (2000 B. C.-1500 B. C.) were a fair-skinned, fair-haired, leptorrhine, dolichocephalic group, and thus essentially Proto-Nordic, is without anthropological evidence. Analysis of the Rigvedas demonstrates that both fair-skinned and dark-skinned peoples are mentioned as being among the propagators of the Vedic culture. The author concludes that the Aryan-speaking invaders of India represented a mixed racial type.—*C. A. Reed*.

21343. Duggan-Cronin, A. M. The Bantu Tribes of South Africa. Reproductions of photographic studies. Section 4, The Swazi. [With an introductory article on the Swazi and descriptive notes on the plates, by Hilda Beemer.] 32p. 32 pl. Cambridge Univ. Press: Eng., 1941.—This is Section IV of 5 sections on the Nguni, a Bantu-speaking group of which the Swazi are a part. Mr. Duggan-Cronin presents a series of excellent photographs showing the Swazi home area, their home-types, their crafts, and selected physical types. Reproduction is superb. Miss Beemer presents a carefully chosen summary of Swazi life and customs, with special ref. to the socio-economic structure.—*W. M. Krogman*.

21344. Fortier, Claude. (U. Montreal, Canada.) Relation de quelques facteurs somatiques à l'efficacité physique dynamique (étude biométrique). I. Rapport poids/surface corporelle. *Rev. Canadienne Biol.* 5(5): 634-641. 1946.—The ratio of body wt. to surface area, a seemingly important factor of thermoregulation during muscular work (of a type which involves moving the body about), is studied in its relation with the physical fitness index obtained by means of the step-test. Two groups, the members of which partake of various occupational fields, in the first, of a single one in the second, were analyzed in that respect. No relation is demonstrable between the physical fitness index and the ratio considered.—*Auth. abst.*

21345. Fortier, Claude. (U. Montreal, Canada.) Relation de quelques facteurs somatiques à l'efficacité physique dynamique (étude biométrique). II. Rapport épaules/hanches. *Rev. Canadienne Biol.* 5(5): 641-648. 1946.—

The shoulder-hip ratio was studied in relation to physical fitness in a pop. made up of 2 groups, the members of which partake of various occupations in the 1st, of a single one in the 2d. The relation, demonstrable for extreme values of the ratio, is apparently non-existent for intermediary values.—*Auth. abst.*

21346. Meredith, Howard V. (State U. Iowa, Iowa City.) Length of upper extremities in Homo sapiens from birth through adolescence. *Growth* 11(1): 1-50. 1947.—This paper deals with the growth of N. American children in length of the upper extremities. It constitutes a review and synthesis of the presently available research on the problem. The source materials utilized were drawn from 28 studies—5 previously unpublished. Following an introductory sketch of growth during prenatal life, the paper is divided into 3 sections: "The Neonatal Period"; "Infancy"; "Childhood and Adolescence." The procedure employed in each section is that of first presenting the relevant investigations and then epitomizing their combined contribution to different aspects of the problem. Consideration is given to analyses of both cross-sectional and longitudinal data. Findings are pooled and integrated with reference to such variables as sex, birth order, prematurity, race, socio-economic status, and secular period. In addition to summarizing what is known regarding growth in superior limb length, the paper focuses attention upon methodological shortcomings and research gaps. The loss to science which has resulted from lack of a standardized anthropometric technique is forcefully portrayed. Research needs become apparent at many points; it must suffice here to cite the need for studies on children of non-White ethnic groups, and on children residing in families of low socio-economic status.—*H. V. Meredith*.

21347. Olivier, Georges. Documents anthropométriques pour servir à l'étude des principales populations du Sud-Cameroun. *Bull. Soc. Études Camerounaises [Douala]* 15-16: 17-86. 4 maps. 1946.—36 tribes of the French Mandated Cameroons south of 7° N are included; for the majority, the means for the principal measurements and indices for men and women are tabulated, the sample size ranging from 6 to 209.—*D. W. Goodall*.

21348. Sudré, René. (French Embassy, Lima, Peru.) Un lejano antepasado del hombre ha sido descubierto en Marruecos. [A distant ancestor of man discovered in Morocco.] *Bol. Mus. Hist. Nat. "Javier Prado"* 9(3/4): 340-343. 1945.—A commentary on the Rabat man (studied by H. Vallois) and its relations to other human fossils.—*W. C. Tobie*.

21349. Wartenweiler, Georg. Wachstum und Formgestaltung des menschlichen Fusses. [Growth and formation of the human foot.] 498-600. 13 fig. Dissertation: U. Zürich, 1943.—After a short but well-chosen section on the evolution and comparative anatomy of the Primate foot, the author offers 15 measurements and 10 indices on his own Swiss subjects: 195 ad. ♂, 150 ad. ♀, 464 ♂ inf. and juv., 394 ♀ inf. and juv. Max. foot L is doubled by 4-5 yrs.; ad. ♀ have 3 × the birth L, ad. ♂ a bit more, so that ♀ feet are on the av. 2-3 cm. shorter. W. says Negro feet are not excessively long. Both max. foot B (across metatarsal heads) and max. foot H (to med. malleolus) are doubled by ca. 4-5 yrs.; again ♂ dimens. are greater. There are 2 useful indices: L-B index where dolichopod is X - 37.9, mesopod is 38-40.9, and brachypod is 41-X; L-H index, where chamaepod is X-26.9, orthopod is 27-29.9, and hypsipod is 30-X. W. offers a brief discussion of the relation of foot measurements to shoes and shoe-sizes. There is an extensive bibliography, as well as raw data tables for ♂ and ♀, aged 7-18 yrs., and adults by occupation groups.—*W. M. Krogman*.

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, Man; Geriatrics; and: Natural selection and the mental capacities of man, 21310; Body adaptation to change in diet, 21707; Basal metabolic studies, Punjab, 21726; Role of amino acids in human nutrition, 21766; Vitamin A reserve of Danish population during the war, 21796; Ascorbic acid metabolism of Bantu soldiers, 21831; Hb variations in women on iron therapy, 21698; Diurnal and other variations in Hb levels, 21699; Fetal movements in relation to mother's activity, 22064; Appendicitis and female sterility, 22071; Biometry in relation to obstetrics, 22074; Effects of maternal undernourishment on newborn infants, Holland, 22092; of sulfapyridine therapy on pneumonia mortality in infancy, 22766; Congenital defects resulting from rubella in pregnancy, 22094; Birth weights of psychiatric patients, 22386; Psychopath-like behavior in war neurotics, 22389)

## POPULATION, FERTILITY, VITAL STATISTICS

21350. Biddy, Cyril. Education for family life. *Eugenics Rev.* 38(2): 87-89. 1946.—The modern family has imperative functions. This implies the need for family life education. Certain social, employment, and grade school conditions are weakening family ties. Education for family life should include sex education, as well as education in all values that make for good citizenship. In it there must be close cooperation between home and school and the cooperation of medical and the various social agency personnel.—A. R. Middleton.

21351. Bigelow, Maurice A. (*Teacher's Coll., Columbia U., N. Y. C.*) The individual and the family in democracy. *Eugenical News* 30(4): 53-59. 1945.—The author believes that the individual reaches optimum development within a family unit under a democratic form of government. The mature individual at 25 yrs. is the product of heredity, physical environment, and social environment. Heredity of the individual depends upon the genetic composition of the parents. In a democracy, responsibility for favorable selection of parents rests with the individuals themselves. The physical environment, remarkably stable before birth, includes after birth such variable factors as air, water, electricity, climate, foods, many chemical substances, bacteria and parasites. The social environment includes "the influences of all other human individuals who directly or indirectly may affect the mental and social development of the individual". Members of the same family group, teachers, religious leaders, and great authors and leaders of the past whose influence is felt in the written record affect the growing individual. The author concludes that a democracy is best for the good heredity, physical environment, and social environment of the individual.—S. B. Pipkin.

21352. Blacker, C. P. Social problem families in the limelight. *Eugenics Rev.* 38(3): 117-127. 1946.—Within the problem family group there is a small and refractory subgroup. Mental backwardness, temperamental instability, and ineducability are its conspicuous qualities. This combination of traits distinguishes them. These conclusions are based on a number of surveys. As to the number of all types of problem families, the Wood Committee tentatively estimated 10% of the country's population, but this may be too high. There are 2 main proposals as to allocation of responsibilities for problem families: In an accredited individual or authority; and to empower the authorities to place whole families under supervision and restraint. The indirect estimate of the eugenic value of parents is by the manner in which they discharge their responsibilities as parents; the direct, by the qualities of their children. Hence the approach to the problem-family problem via the children is commendable on eugenic, as well as on humanitarian grounds.—A. R. Middleton.

21353. Chilver, Sally. Myrdal's "Nation and Family." *Eugenics Rev.* 38(3): 142-148. 1946.—Swedish high life-expectancy, from high birth-ratio at the beginning of the century, has caused excess of adults. From 1910 net birth rates declined. Average marriage age is high. Industrialization caused unfavorable sex ratios. The Swedes were not untried in social discussion when population declined. In England, discussion of these issues has been characteristically superficial, and minority demands may sidetrack attention from central issues. Myrdal believes a democratic population policy feasible, contingent upon the attitude on women's problems and emancipation. The economic roles of women are: (1) Depending on the husband's status, semi-parasitic and accommodated to child-bearing. It misfits modern social rhythms and the women are unadjusted. (2) Other pro-

ductiveness, combined with child-bearing only exceptionally. The women are regarded favorably as producers but indifferently or unfavorably as mothers. Sweden has laws protecting working mothers and recognizes needs for solution of other problems.—A. R. Middleton.

21354. Cook, S. F. Survivorship in aboriginal populations. *Human Biol.* 19(2): 83-89. 1947.—The approximate age distribution for several primitive populations is determined from censuses and from archaeological data. In some populations, e.g., California prehistoric natives, survivorship was very low, extending scarcely into middle age. In others the mean duration of life was much longer. It is concluded that there is no specific survivorship characteristic of aboriginal peoples as such. On the other hand, each group responds to the factors controlling its environment without reference to its cultural status.—S. F. Cook.

21355. Fawcett, C. B. (*U. London, Eng.*) The numbers and distribution of mankind. *Sci. Month.* 64(5): 389-396. 1947.—There are about two billion living men on 50 million square miles of land. They are concentrated in western Europe (168 per sq. mi.), the Far East (292 per sq. mi.), and India (400 per sq. mi.), these being the most productive areas; eastern N. America, equally productive, has reached a density of only 52 per sq. mi. There has been a great increase in the last few centuries, and further increase to a few times the present population is to be expected, but the possible total productivity of the earth will impose a limit.—H. F. Copeland.

21356. Glass, D. V. Population trends in Palestine. *Eugenics Rev.* 38(2): 79-86. 1946.—Between the first census, 1922, and that of 1931, population statistics were unsatisfactory. On the basis of more recent studies of population trends it is estimated that, in the absence of any decline in Moslem fertility and of Jewish immigration, the proportion of Jews to the total population would fall quite considerably by 1971. Current official studies of reproductive trends show that while Moslem fertility appears to have risen between 1931 and 1942, Jewish fertility has fallen, and the fall in Jewish mortality has not been sufficient to keep the net reproduction rate constant. Their estimate for 1960 is about a 3:1 ratio in favor of Moslems. There is yet no clear answer as to how the fertility and mortality of the 2 main communities are likely to develop. What effect Western influences may yet have on the Moslems is unknown. So far, it has been negligible as to Moslem fertility. Fertility of Jews fell between 1931 and 1941 but has risen markedly since then. As anticipated, only very tentatively, it may be concluded that fertility of Moslems is unlikely to fall rapidly in the near future while that of Jews is likely to fall approx. as it did between 1931 and 1941. There is imperative need that demographic statistics of Palestine be improved and expanded to reveal changes in inherent rates of growth if and when they occur.—A. R. Middleton.

21357. Olden, Marian S. (*Birthright, Inc., Princeton, N. J.*) Present status of sterilization legislation in the United States. *Eugenical News* 31(1): 3-14. 1 fig. 1946.—Although California, Virginia, Kansas, Michigan, Minnesota, Oregon, N. Carolina, Wisconsin, and Indiana rank in the order mentioned with respect to total number of sterilizations of mental defectives performed, the more proper comparison is according to the number of sterilizations per 100,000 population. By this method of evaluation the states rank as follows: Delaware, California, Kansas, Oregon, Virginia, N. Dakota, S. Dakota, New Hampshire, and Minnesota. Sterilization of mental defectives was reduced almost to nil by the loss to the armed forces of surgeons attending mental hospitals. The greatest opposition to the program of sterilization of mental defectives comes from the Roman Catholic

Church. Many of the states with sterilization laws permit sterilization of inmates of institutions only. Utah and S. Dakota form an enlightened exception to this rule. The S. Dakota law is especially well designed in that it provides for a continuous census of the mentally defective, their education, segregation, and prevention of marriage unless one of the couple has been sterilized. The author feels that a thorough-going campaign of education for the general public is a necessary precedent for a well designed sterilization bill that will be enforced after it is made a law. It is thought wise to present a well planned bill in detail rather than a bill pared down to a minimum because a discussion of the bill itself is a favorable means of public education.—*S. B. Pipkin.*

21358. Wofinden, R. C. Problem families. *Eugenics Rev.* 38(3): 127-132. 1946.—In Rotherham borough about 5% of all children under 14 yrs. are members of problem families. In Herefordshire they comprise 1.9%. The Pacifist Service Units claim only 1 family in 10 shows sustained improvement with assistance. There is need for a more fundamental approach. In Herefordshire 29.2% of these mothers are intellectually defective and 25% of the children are retarded 3-4 yrs. Energetic attack on this problem offers a good chance of reducing problem-family problems by 20-30%. These families are classified into groups, each requiring different handling. Nursery schools and classes, training of girls in housecraft and boys and girls in parentcraft are long-term policies which will show rich results. Possibly, by a more enlightened outlook on marriage guidance, contraception and sterilization, more conscious selection of marriage partners with a view to the character of future children will come. Better housing is not effective in improving problem families. The problem is handed down by inherited characteristics and atrocious upbringing of children. Further scientific studies, better detection and disposal of mental defectives, and exptl. parent-training centers are urgently needed.—*A. R. Middleton.*

21359. Anonymous. Record low mortality in 1946. *Statist. Bull. Metropolitan Life Insurance Co.* 28(1): 1-5. 1947.—The age standardized death rates of white ♂♂ and ♀♀ among the company's industrial policyholders were lower in 1946 than in any previous year. Declines from 1942 to 1946 exceeded 10% at ages 10-14 and 25-44 for ♂♂ and at ages 10-64 for ♀♀. New low records (also on an age standardized basis) were set by diseases of the puerperal state, the principal communicable diseases of childhood (as a group), pneumonia, diarrhea and enteritis, appendicitis, and tuberculosis.—*P. K. Whelpton.*

21360. Anonymous. Age at death in World War II. *Statist. Bull. Metropolitan Life Insurance Co.* 28(1): 5-7. 1947.—War deaths of all policyholders were distributed by age as follows: 15-19, 12.3%; 20-24, 46.8%; 25-29, 25.6%; 30-34, 10.1%; and 35 and over, 5.2%. A substantially higher proportion of the war deaths of civilians (chiefly those in the Merchant Marine) occurred at 35 or older.—*P. K. Whelpton.*

21361. Anonymous. Americans marry young. *Statist. Bull. Metropolitan Life Insurance Co.* 28(2): 8-10. 1947.—The proportion of men and women under 25 who have ever married is substantially higher in the U. S. than in Canada, Australia, New Zealand, or most of the European countries (excluding the U.S.S.R.), according to recent census statistics. France is in 2d place. Because of a relatively high sex ratio, the proportion of ♂♂ marrying by age 50 is lower in the U. S. than in several other countries, but the corresponding percentage for ♀♀ is highest here. "Our favorable position with respect to the chances of marriage, and more especially early marriage, reflects the advantageous economic situation in our

country. . . . Then, too, our traditions and social attitudes favor undertaking of family life relatively early."—*P. K. Whelpton.*

21362. Anonymous. Life has become much safer for children. *Statist. Bull. Metropolitan Life Insurance Co.* 28(3): 4-6. 1947.—Death rates of children aged 1-14 were less than half as large in 1946 as in 1930, among those insured in the Industrial Department of the Company. Most of the improvement was due to reductions in the rates for measles, scarlet fever, whooping cough, diphtheria, diarrhea and enteritis, tuberculosis, pneumonia, appendicitis, rheumatic fever and organic heart disease, and accidents.—*P. K. Whelpton.*

21363. Anonymous. Death and the Negro. *Statist. Bull. Metropolitan Life Insurance Co.* 28(3): 7-9. 1947.—"Although the Negro population has benefited very materially from recent advances in medical science and public health administration, its mortality is still substantially higher than that for white persons." Most of the difference is due to higher death rates for influenza and pneumonia, tuberculosis, syphilis, the cardiovascular-renal diseases and homicides.—*P. K. Whelpton.*

21364. Anonymous. Current mortality remarkably low. *Statist. Bull. Metropolitan Life Insurance Co.* 28(4): 1-2. 1947.—The mortality rates of the Company's Industrial policyholders were lower in the first quarter of 1947 than in the corresponding period of any prior year.—*P. K. Whelpton.*

21365. Anonymous. Longevity in United States at new high in 1945. *Statist. Bull. Metropolitan Life Insurance Co.* 28(4): 3-5. 1947.—Life tables for 1945 prepared and published by the National Office of Vital Statistics show a significantly longer expectation of life at birth than do tables for any prior year. Between 1939-41 and 1945 gains in the expectation of life at age 65 were smaller absolutely but larger relatively than those in the expectation of life at birth.—*P. K. Whelpton.*

21366. Anonymous. Marked decline in mortality among older people. *Statist. Bull. Metropolitan Life Insurance Co.* 28(4): 7-10. 1947.—The standardized death rate of white ♂♂ aged 45-74 was 37.1% lower in 1942-46 than in 1911-15, according to the Company's weekly premium paying industrial business. For white ♀♀ the decline was 43.9%. The change was due primarily to the reduction of the death rate for pneumonia and influenza, tuberculosis, the cardiovascular-renal diseases, and accidents.—*P. K. Whelpton.*

#### MISCELLANEOUS

21367. Jones, H. E. Sex differences in physical abilities. *Human Biol.* 19(1): 12-25. 1947.—Static dynamometric strength attains its maximum rate of puberal growth at about the age of 12.5 yrs. in girls. At this time sex differences in strength are relatively small. During the next 3 yrs., however, a reduced or arrested growth is to be noted in this function among girls, and a high velocity of growth among boys; by the age of 16 distributions for the 2 sexes overlap so little that nearly all boys become stronger than the average girl. When different aspects of strength are compared, it is found that among boys growth patterns for pulling and thrusting strength are identical, but among girls they are sharply differentiated. Sex differences are also shown in the relative strength of right and left grip, since at all ages in adolescence girls exhibit a greater differentiation of the 2 hands, with more predominant dexterity. Average sex differences in static dynamometric strength must be assumed to rest primarily upon biological factors, although the differences normally obtained may be altered by differential practice and training.—*H. E. Jones.*





# ECOLOGY

## Editors

ORLANDO PARK, *General Animal Ecology*

G. D. FULLER, *General Plant Ecology*

G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*

GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL AND ANIMAL ECOLOGY]—Evolutionary change under domestication, rat, 21275; Parallel series of associated characters in diverse insect groups, 21299; Attachment of sedentary marine organisms to petrolatum surfaces, 21411; Effect of explosives on marine life, 21428; Influence of mammals and birds on reseeded of conifer forests, U. S., 23289; Wireworms, 23456, 23474, 23476; Cave spiders, 23730; Water beetles, 23744; Trichoptera, 23817; Field study of rattlesnakes, 23857. [PLANT ECOLOGY]—pH meter, 21333; Lake types in Esthonia, 21422; Planting eelgrass, 21437; Yeasts inducing spore germination in Hymenomycetes, 23100; Flora of Iceland, 23138; Spring temp. and tree growth, 23260; Sampling techniques, 23263; Growth of conifers on prairie soil, U. S. A., 23269; Pinus pinaster in Portugal, 23283; Fire as affecting regeneration of ponderosa pine, 23296)

## GENERAL

21368. Beebe, William, and Jocelyn Crane. Ecology of Rancho Grande, a subtropical cloud forest in northern Venezuela. *Zoologica [New York]* 32(1): 43-60. 5 maps, 5 pl. 1947.—This is a general study of the ecological conditions at Rancho Grande, headquarters of the 45th and 46th expeditions of the Dept. of Tropical Research of the New York Zool. Soc. It is situated in the National Park of the State of Aragua, in north-central Venezuela (10° 21' N. Lat., 67°, 41' W. Long.), 80 km. w. of Caracas, at an elevation of 1100 m. in the undisturbed montane cloud forest which covers this part of the Caribbean range of the Andes. The first part of the paper deals with a general identification of the 14 adjacent zones; Abyssal, Pelagic, Shore Water and Reefs, Sandy and Rocky Littoral, Mangrove, Fresh-Water, Llanos, Savanna, Cactus Scrub, Thorny Woodland, Deciduous Seasonal Forest, Semi-evergreen Seasonal Forest, Montane Cloud Forest and Aerial. Then follows, in greater detail, the physical and biol. characteristics of the Rancho Grande Cloud Forest, in which, within 1 km. of the laboratory, most of the investigations were carried on. The geography of this limited area is discussed, and the meteorology, including general weather conditions, rainfall, humidity, sunshine, temp. and wind. Finally, the botany and zoology are briefly dealt with. This Rancho Grande area is generally subtropical, uniformly cool and damp throughout the year because of the prevalence of the mountain cloud cap, resulting in an abundance of mosses, ferns and epiphytes. This study is intended as an introduction to the numerous zoological papers which are in prepn.—William Beebe.

21369. Maulik, S. Relationships between the assemblages of plants fed upon by different insects, and between the assemblages of insects that feed upon different plants. *Nature [London]* 159(4034): 269. 1947.—On the basis of available records of Chrysomelid beetles' food habits, the author makes tentative generalizations, known to have exceptions, on which he requests comparison with other groups of insects: If an insect feeds on > 1 plant species, then other insect spp. which feed on any one of these plant species can feed on all. If a plant is fed upon by > 1 insect species, then other plant spp. fed upon by one of these insect spp. can be fed upon by all.—R. Walker.

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue Northern Venezuela, 21368: Microclimates and plant communities, India, 21395; Summer temp. for game fishes in Penna. streams, 21435; Hot wire anemometer as a flowmeter, 21596; Temp. effects on nitrogen metabolism in dogs, 21754; on Hb levels, 21699; on drug action, 22250; Cold injury in rabbits, 21490, 21491, 21493, 21494, 21495; Frost bite and trench foot, 21498; Temp. in relation to sterility in rams, 22051; Physiologic response of subjects exposed to high effective temps. and elevated mean radiant temps., 22399; Effects of shade and sprinkling on summer comfort of dairy cows, 22571; Fall precipitation and forage yields the following season, Great Plains (U. S. A.), 23152; Insolation, sunspot cycle and soil formation, 23188; Measuring evaporation from soil, 23193; Influence of weather on blossoming of apples, 23206; Rainfall and cacao production, Belgian Congo, 23208; Rainfall and the flowering of Coffea, 23221;

Biometeorol. studies in viticulture, 23228; Temp. and humidity in potato storage, 23235; Spring temp. and tree growth, 23260; Forest meteorology, 23291; Forecasting tomato blight outbreaks, 23419; Summer weather and tomato blight, 23429; Climate and insect life, 23449; Weather and bird population, Ohio, 23888)

21370. Day, W. R. (*Imp. Forest. Inst., Oxford, Eng.*) Summary of ecological papers read at joint meeting of Royal Meteorological Society and British Ecological Society. *Quart. Jour. Roy. Meteorol. Soc.* 72(2/3): 175-180. 1946.

21371. Fobes, C. B. (*Western Bur. Airport Sta., Caribou, Me.*) Spring opening of a Maine lake and river compared, based on a ninety-six year record. *Bull. Amer. Meteorol. Soc.* 28(3): 149. 1947.—The opening dates to navigation of the Kennebec R. have been recorded at Gardner since 1785, and the ice-clearing record of nearby Cobboscontee Lake has been kept for 96 yrs. On the average the river opens 20 days sooner than the lake.—Frederick Sargent.

21372. Gunton, H. C. Report on the phenological observations in the British Isles from December, 1944 to October, 1945. *Quart. Jour. Roy. Meteorol. Soc. [London]* 72 (Phenol. No.): PR 1-43. 1946.

21373. Gunton, H. C. Report on the phenological observations in the British Isles from October, 1945 to September, 1946. *Quart. Jour. Roy. Meteorol. Soc. [London]* 73 (Phenol. No.): PR 1-31. 1947.

21374. Quigley, George D. (*Agric. Expt. Sta., College Park, Md.*) The effect of barometric pressure changes upon temperature control incubators equipped with gas water thermostats. *Poultry Sci.* 26(2): 209-210. 1947.—A constant relationship of a straight-line nature was observed between incubation temp. controlled by a gas water thermostat and changes in atmospheric barometric pressure. For each change in pressure of 10 mm. of Hg, the incubation changed 0.05034°C, on a regression value of  $Y = 37.368^\circ + 0.05034 X$ , with a midpoint of 761.-761.9 mm. of Hg.—G. D. Quigley.

21375. Wynne, R. L. A simple formula for the calculation of atmospheric dryness. *Brit. Med. Jour.* 1947(4502): 528-529. 1947.—A parabolic curve with the equation  $y = x^2/100 - x/2 + 12$  is remarkably similar between 30° and 90°F to a plot of the vapor pressure of water at saturation vs. the wet bulb temp. (W.B.T.). Using the general equation for the partial pressure of water vapor (expressed in millibars),  $P = S^w - f\Delta$ , where  $P$  is the actual pressure in millibars of water vapor in the observed conditions,  $S^w$  the pressure at the W.B.T.,  $\Delta$  the difference in degrees F between the W.B.T. and D.B.T., and  $f$  a constant which depends upon the pressure and velocity of the air passing over the bulbs; and the equation  $S^w = W^2/100 - W/2 + 12$ , where  $W$  is the W. B. T., he deduces that  $P = W^2/100 - D/2 + 12$ , where  $D$  is the D.B.T. and when  $f$  is  $1/2$ . He then calculates an equation for the "saturation deficiency" of the atmosphere,  $S^s - P$ , where  $S^s$  is the saturation pressure of the D.B.T. The equation turns out to be  $S^s - P = (D + W)(D - W)/100$ , and might be called an index of the drying power of the air. This index approximates the true value of the saturation deficiency in millibars. The hazards of hot moist and of cold atmospheres in the operating room are emphasized. It is suggested that the atmosphere of operating theatres should be more rigorously investigated and controlled.—Frederick Sargent.

21376. Anonymous. Discussion on the report of the phenological observations in the British Isles from December

1944 to October 1945. *Quart. Jour. Roy. Meteorol. Soc.* [London] 72(312/313); 193-198. 1946.

#### ANIMAL

21377. De Laubenfels, M. W. Ecology of the sponges of a brackish water environment at Beaufort, N. C. *Ecol. Monogr.* 17(1): 31-46. 1947.—15 spp. occur near Beaufort; 10 of these are also W. Indian, only 2 are peculiar to the locality, including *Calyx poa*. Five spp., significant ecologically, are treated at length. They are *Microciona prolifera*, *Hymeniacidon heliophila*, *Cliona celata*, *Lissodendoryx isodictyalis* and *Haliclona permollis*. Beaufort harbor is notably devoid of sponge life below low tide mark, probably because of brackish conditions. Intertidally, the 5 spp. are abundant. Preliminary investigations and numerous field observations indicate that these sponges are helped by currents, even very vigorous ones. They endure temps. from about zero to at least 33°C. Sponge tissue may be upwards of 4° warmer than air and water temps. when in full sunlight. In general, partial illumination seems to be a better environmental condition than full sun. Low salinity may cause damage, but the intertidal sponges can recover from its effects. Ninety-seven percent of sponge genera, however, are restricted to water of full salinity. There is evidence that the boring sponge, *Cliona*, hides in calcareous material chiefly to escape exposure to low salinity, and oysters may possibly be protected from *Cliona* by dousing with fresh water. Sponges, other than *Cliona*, render little or no damage to oysters, but do overgrow and smother many other sessile invertebrates, especially barnacles. Sponges are inhabited, and probably damaged, by numerous nematodes, annelids and amphipods. Many sponges contain microscopic plant symbionts that are probably beneficial.—M. W. de Laubenfels.

21378. Dice, Lee R. (*U. Michigan, Ann Arbor.*) Effectiveness of selection by owls of deer-mice (*Peromyscus maniculatus*) which contrast in color with their background. *Contr. Lab. Vertebrate Biol. Univ. Michigan* 34: 1-20. 1947.—Equal numbers of two different color varieties of the mice were exposed to owls—(*Asio wilsonianus* and *Tyto alba pratincola*) for 15-min. periods under controlled laboratory conditions. A selection index is proposed to measure the effectiveness of selection. In a situation where 2 types of prey, A and B, are available in equal numbers, if the numbers taken are respectively, *a* and *b*, then the selection index of A is  $a - b/a + b$ . The selection index may vary between +1 and -1, being zero in the absence of selection. The significance of any given selection index may be tested by chi-square. In those expts. in which the owls were forced to depend very largely on sight for capturing the deer-mice the selection indexes in favor of the concealingly colored mice ranged from 0.24 to 0.29. Selection occurred over a wide range of illuminations, extending from about the lower limit at which owls are able to see their prey to an intensity of light above which these nocturnal mice usually become inactive. In an expt. in which buff and gray mice with pelage colors similar to those that distinguish races in nature were used as prey, a selection index of 0.24 was obtained in favor of the mice that were inconspicuous when viewed against their backgrounds. From the very high possible rates of selection indicated by these experiments, it is concluded that natural selection can theoretically produce very rapid evolution whenever a genetically variable population is exposed to its action.—Lee R. Dice.

#### PLANT

21379. Albertson, F. W. (*Fort Hays State Coll., Kansas*), and J. E. Weaver. (*U. Nebraska, Lincoln.*) Reduction of ungrazed mixed prairie to short grass as a result of drought and dust. *Ecol. Monogr.* 16(4): 449-463. 17 fig. 1946.—This is the history of a typical area of mixed prairie near Phillipsburg in north-central Kansas from 1920 to the time it was plowed in 1945. The mid-grasses, little bluestem (*Andropogon scoparius*), side-oats grama (*Bouteloua curtipendula*), and western wheat grass (*Agropyron smithii*), together with taller ones—big bluestem (*Andropogon furcatus*), Indian grass (*Sorghastrum nutans*), and nodding wild rye (*Elymus canadensis*)—alternated with blue grama (*Bouteloua gracilis*) and buffalo grass (*Buchloe dactyloides*) or formed an open layer above them. About 50 spp. of forbs, many of which formed extensive societies, were found. Great damage was done by a single year (1933) of intense drought and burial

by dust. Although blue grama and buffalo grass lost heavily, they alone recovered rapidly with spring rains. Only about 15 spp. of the perennial forbs remained, but annual weeds became plentiful. 5 yrs. of continuous or intermittent drought was followed by a period of extreme drought. Despite the deep loess soil, in the spring of 1940 only a little vegetation was left alive. Chief perennials were buffalo grass and blue grama. Nearly all other perennial grasses had died; native forbs were reduced to remnants of 11 spp. Heavy rainfall, beginning in 1941, permitted the rapid spread of buffalo grass and blue grama and by 1942 the consolidation of the formerly open cover. The average basal area in 11 meter quadrats containing these grasses was from 1940 to 1944 (inclusive) 13, 36, 48, 61, and 72%. Similar gains were recorded in other quadrats. After 1942, buffalo grass greatly exceeded blue grama in amt. Usually these grasses became so tall (6-8 inches) and dense that the soil was completely concealed.—J. E. Weaver.

21380. Asprey, G. F. The vegetation of the islands of Canna and Sanday, Inverness-shire. *Jour. Ecol.* 34(1): 182-193. 2 pl., 2 fig. 1947.—The basic rocks of which the islands of Canna and Sanday are composed may account for the presence of spp. such as *Anthyllis vulneraria*, *Koeleria cristata*, *Avena pubescens*, *Daucus carota* and *Gymnadenia conopsea*, but their effect is overshadowed by the major factor of climate in which a relatively high rainfall is associated with high atmospheric humidity. In general, topography accounts for the distribution of grassland, *Calluna* heath and moorland, the latter being confined to flat, poorly drained areas such as the plateaus of Canna. Grazing and burning have allowed grassland to spread at the expense of *Calluna* heath on the slopes and mounds, but these two factors may be responsible for the spread of moorland vegetation. It is impossible to deny the resemblance of the moorland to blanket bog and the *Scirpus* climatic moor of Fraser; no great depth of peat is to be found, however, and although *Sphagnum* spp. undoubtedly play a part in its formation, in so far as they impede surface drainage and induce acid conditions, it is the short forms that are prevalent, hummock formation being only local and largely confined to boggy depression. It is suggested that woodland and shade-loving spp. on the n. and n.-e. cliffs may be relicts of former woodland. At present, natural tree growth is confined to an occasional stunted rowan (*Sorbus aucuparia*) on the cliffs and to a small patch at the base of the cliffs in the s.w. Neighboring islands of Soay and Eigg support natural oaks, birches and willows, and there would seem to be no edaphic or climatic reason why oak-birch woodland or scrub should not be found on Canna and Sanday. When the islands were more thickly populated, destruction of trees for fuel, especially here where there is little peat development, combined with non-regeneration due to seedling destruction by sheep, cattle and rabbits, may account for the present paucity of natural woodland.—Auth. summ.

21381. Baker, Frederick S. (Chairman.) Forest cover types of western North America. Report of the Committee on western forest types. 35p. Soc. Amer. Forest.: Washington, D. C. 1945.—The types are classified according to the composition of the existing cover, without regard to whether this is the permanent or a temporary type. Each of 50 types is treated under the following headings: definition and composition, nature and occurrence, transition forms and variants, and relation to other classifications.—W. N. Sparhawk.

21382. Braccini, Paolo. Sulla composizione botanica dei pascoli alpini utilizzati dagli ovini. [The botanical composition of Alpine sheep pastures.] *Italia Agric.* 78(10): 709-714. 3 fig. 1941.—The flora of the sheep pasture grounds in the high regions of the Bergamascan Alps is dealt with. The composition of this flora varies greatly in accordance with altitude, exposure, season, etc. A list of plants is given and the following data are reported: *Festuca pumila*, liked by sheep, though of a low nutritive value, is only found on the highest pastures near the snow limit; *Nardus stricta* has a bad reputation as a dangerous weed, occupying a large part of pasture grounds and excluding better herbs. The author believes, however, that in pastures, at 2,000 to 2,500 m., this grass is not entirely useless for it is grazed before the flowering period. *Agrostis alpina* has too hard leaves even for sheep. *Poa alpina*, very common, attains in higher regions no more than 2-3 cm., and these dwarf plants give a soft fodder preferred by sheep. In better conditions only the leaves are



consumed by the animals, the culms being too hard. All the spp. of Leguminosae are excellent forage plants; *Lotus corniculatus*, especially, is much appreciated. Among the Compositae, *Artemisia glacialis*, *Leucanthemum alpinum* and *Hieracium alpinum* are eaten, *Bellis perennis* is never touched. The 2 spp. of *Meum* (Umbelliferae), *M. mutellina* and *M. alhamanticum*, are excellent forages, and their presence in a meadow is an index of its grazing value. *Potentilla aurea* and *P. nivea* (Rosaceae), both not wide-spread, are appreciated as resistant to trampling and as well adapted to all kinds of soils. *Dipsacus sylvestris*, *Carduus nutans*, *Carlina acaulis*, *C. alpina* and many other spp. are deemed useless; *Aconitum napellus*, *Gentiana lutea*, *Senecio alpinus* are noxious. The nitrophilous plants growing in the surroundings of the Alp chalets are listed. All these plants—*A. napellus*, *Urtica dioica*, *Rumex acetosa*, *R. alpinus*, etc.—exhibit vigorous growth, but they are refused by sheep and the shepherds consider them as abortifacients.—W. Bally.

21383. Chapman, H. H. (Yale U., New Haven, Conn.) *Natural areas. Ecology* 28(2): 193-194. 1947.—Natural areas are defined as all areas of land whose vegetative cover has not been modified by the influence of man. The natural forces, wind, fire, insects, disease, climate, constantly produce changes in the forest cover, resulting in new stands often of different spp. Lumbering, farming, grazing and other human interference produce unnatural successions. Unregulated protection of wildlife may do so. Longleaf pine (*Pinus palustris*) in the South depends on naturally recurring forest fires at 2- to 5-yr. intervals. To reproduce this species by natural seeding requires imitation of this method. Fires every yr. are destructive but total exclusion of fire is equally prohibitive of natural reproduction. Natural fires were caused by lightning igniting dead snags, from which fire could spread later. Loblolly pine (*P. taeda*) and slash pine (*P. caribaea*) respond to different natural factors, allied to site and soil moisture and ground cover and these natural conditions again indicate successful methods of natural reproduction. Climax types produced by absences of natural agencies of destruction are not numerous or plentiful and may be of less value to man than subclimax, or even fire climax types such as longleaf pine. White pine in natural stands practically always originates after blowdown and/or fire. Yellow birch only grows in small protected openings in the forest. We need examples of all stages of natural development of forest types in order to learn the art of improving upon natural processes in forest management.—H. H. Chapman.

21384. Davidsson, Ingolfur, Gróður á. Arskógsströnd. [The vegetation of Arskógsströnd.] *Náttúrufræðingurinn* 10: 72-89. 1940.—The author describes the vegetation of Arskógsströnd at the Eyjafjörð in northern Iceland. The paper is rather popular, but contains valuable lists of the vegetation from different parts of the locality and in a survey the plant associations are described. The matter is, however, more scientifically treated in Davidsson: Vegetation of Arskógsströnd, North Iceland, *Acta Naturalia Islandica* 1(4).—Doris Löve.

21385. Davidsson, Ingolfur. Gróður í Borgarfirði og Njardvík eystra. [The vegetation of eastern Borgarfirðir and Njardvíkur.] *Náttúrufræðingurinn* 11: 16-30. 1941.—The author describes the situation and type of 2 firths on eastern Iceland, the Borgarfirðir and the Njardvíkur. The commonest associations are *Vaccinium myrtillus*-*V. uliginosum* assoc., and *Calluna vulgaris* assoc. New to the east coast is *Listera ovata*. A list of the 227 plant spp. found completes the paper.—Doris Löve.

21386. Dyksterhuis, E. J., and E. M. Schmutz. (U. S. Soil Conserv. Serv., Fort Worth, Texas.) Natural mulches or "litter" of grasslands: With kinds and amounts on a southern prairie. *Ecology* 28(2): 163-179. 5 fig. 1947.—A review of the abundant literature on plant residues of cropland and forest is contrasted with the meager literature and lack of classification of the surficial organic matter of grasslands. Recent findings on mulches in the sciences of soil and water conservation and microbiology demand quantitative studies on grassland and standardization of terminology. Procedures for segregation and measurement of different classes of surficial organic matter of grasslands were evolved. Four classes and terms are proposed. Abridged definitions are (1) Green Herbage or Green Forage consisting of all green and live plant material and dead tips of growing grasses; (2)

Cured Herbage or Cured Forage (of arid and semiarid climates) consisting of standing, dried plant materials yet readily grazed and little affected by weathering; (3) Fresh Mulch consisting of fresh residuum of herbage and corresponding to the A<sub>0</sub> horizon of soil science and; (4) Humic Mulch consisting of largely decayed, fragmented, organic residuum of fresh mulch, corresponding to the A<sub>0</sub> horizon of soil science. On subhumid true prairie in excellent condition, under moderate year-round grazing, the amt. of fresh mulch varied from about 4,600 lbs. air-dry per acre in late Jan. to 3,300 lbs. on July 1. Humic mulch varied from about 2,300 lbs. on Sept. 1 to 1,500 lbs. on Apr. 1. Green herbage varied from less than 100 lbs. in Jan. to about 4,100 lbs. on July 1. Total surficial organic matter varied from about 6,000 lbs. on Apr. 1 to 9,200 lbs. on Sept. 1. The amt. of each class of material was widely different on the same date at different locations depending upon conditions of past use. On Apr. 10, a range in fair condition, a native-hay meadow, a relict of the climax, and a range in excellent condition had 290, 656, 2,718, and 3,044 lbs. of humic mulch, respectively. The corresponding amts. of fresh mulch were 1268, 1282, 6319, and 2277 lbs. Relict climax vegetation had a layer of earthworm casts beneath the humic mulch layer weighing 20,960 lbs. air-dry per acre. Probable applications of data on mulches to problems of condition and proper use of grasslands are stressed.—Authors.

21387. Friesner, Ray C., and J. E. Potzger. The Cabin Creek raised bog, Randolph County, Indiana. *Butler Univ. Bot. Stud.* 8(1/8): 24-43. 1946.—Borings at 50-ft. intervals on 8 radii, all of which pass through the central deepest portion, show that the base upon which deposition was made comprised a narrow central valley with steep sandy slopes on either side of which were other successive ravines and sand ridges. Correlation of character of deposits and pollen profiles shows that the deepest depressions filled in rapidly through wash of organic material from the adjacent steep slopes together with the precipitation of marl; while the ridges and more elevated portions accumulated land-deposited material. These depositions took place simultaneously, beginning soon after the removal of the ice. The land-deposited material comprised wood peat, sedge peat, and sedge-wood peat. A higher percentage of the total profile is occupied by spruce dominance than in any other Indiana bog studied. Deposition in the valleys and ravines must have been very rapid since approx. the same time interval is involved in deposition of the lower 28 ft. in the deepest depression and the lower 7 ft. in the boring whose bottom is on the top of the highest sand ridge. Conversely, the upper levels of deposition occurred very slowly. Only 4 ft. of deposit occurred in the valley and 6 ft. on the sand ridge since the close of the period of spruce dominance. The surface of the deposit on the highest sand ridge is 10 ft. above the level of the bog margin while that of the deposit in the valley is only 10 inches above the level of the bog margin. The close of the spruce period is followed abruptly by a mixed mesophytic forest in which oak is more abundant than any other single genus. The present vegetation presents a number of striking features: very large % of coverage by prairie spp., total absence of ericads, presence of a number of northern disjuncts.—R. C. Friesner.

21388. Gilbert, Lionel. Glimpses of a sub-tropic rain forest. *Victorian Nat.* 63(9): 196-198. 1947.

21389. Keller, Carl O. An ecological study of the Klein Woods, Jennings County, Indiana. *Butler Univ. Bot. Stud.* 8(1/8): 64-81. 1946.—A study based on frequency, abundance, and basal area shows 14 spp. of tall trees, 6 low trees, 3 shrubs, and 7 lianas. The following tall trees showed frequency and basal area percentages as follows: *Fagus grandifolia*, 90 and 21.61; *Acer rubrum*, 76 and 6.24; *Nyssa sylvatica*, 74 and 6.58; *Liquidambar styraciflua*, 70 and 9.5; *Fraxinus americana*, 70 and 0.35; *Ulmus thomasi*, 50 and 0.52; *Quercus palustris*, 38 and 27.05; *Q. alba*, 38 and 21.69. This and 18 other forests of the Illinois Drift Plain with which it is compared represents transition types of the mixed mesophytic forest in various stages of transition from the near flood-plain type to the approaching climax.—R. C. Friesner.

21390. McVaugh, Rogers. (U. Michigan, Ann Arbor.) Establishment of vegetation on sand-flats along the Hudson River, New York. *Ecology* 28(2): 189-193. 11 fig. 1947.—Flats formed by dredging in Columbia and Dutchess Counties

supported in 1935 but one arborescent species (*Populus deltoides*) and 3 abundant weedy herbaceous spp. In 1945 vegetational cover had increased, and > 20 woody and herbaceous spp. were established.—Rogers McVaugh.

21391. Misra, R. (*Hindu U., Benares, India.*) A study in the ecology of low-lying lands. *Indian Ecol.* 1(1): 26-46. 1946.—Depressions in low-lying lands around Benares are classified into puddles, pools and ponds depending on their size and duration for which they contain water. The water relations of the soil are correlated with the vegetation. The conditions of the soil are responsible for the growth of a meadow vegetation characteristic of drying muds. The analysis of vegetation and habitat reveals that the plant communities, while showing seasonal aspects, are not entirely seasonal, and it is possible to interpret and classify them on the basis of developmental succession.—B. A. Razi.

21392. Morton, Friedrich. Quellen in Hallstatt und ihre Pflanzengesellschaften. III. Quellen im Echerntale und am Nordfuss des Hagenecks. [Springs near Hallstatt and their plant societies.] *Arch. Hydrobiol.* 39(2): 353-361. 1942.—5 springs and their plant societies near Hallstatt (Austria) are descr.—Ingo Findenegg.

21393. Paasio, Ilmari. (*U. Helsinki, Finland.*) Zur Kenntnis der Waldhochmoore Mittelfinlands. *Acta Forest. Fennica* 49(2): 1-36. 1940.—The topography, hydrography, and plant associations of sphagnum-pine peat-moors were investigated in 4 places in eastern Finland. In the middle and east of Finland, the raised peat-bogs have an equivalent in the Empetrum-Sphagnum fuscum peat-moor, the surface of which is horizontal and level. A warm and oceanic climate being favorable for the formation of boggy hummock pine peat-moors, these only occur in s.-w. Finland. Farther n. their formation is hindered by the low temp., in the e., by the continental character of the climate. A Carelian swamp complex is partly due to topographical causes, but mainly to the continental character of the climate.—P. Mikola.

21394. Paasio, Ilmari. (*U. Helsinki, Finland.*) Zur pflanzensoziologischen Grundlage der Weissmoortypen. *Acta Forest. Fennica* 49(3): 1-81. 1940.—Based on ample literature on the vegetation of sphagnum-bogs, the statement is made that the plant cover of a sphagnum-bog generally consists of 2 layers, the bottom-layer and the surface-layer. In each, the vegetation mainly consists of 1 sp., seldom of 2. The main sp. of the bottom-layer is, almost invariably, a *Sphagnum*, that of the surface-layer, a *Carex*, *Eriophorum*, *Scirpus*, etc. The formation of a plant association of sphagnum-bog is detd., on one hand, by the quality and quantity of bog water, on the other, by the different site requirements and mutual competition of the spp. In defining sphagnum-bog types according to the vegetable mantle, the main division is to be made by the bottom-layer. Based on the main groups thus obtained, the subdivisions are made into sphagnum-bog types according to the surface-layer. 141 sphagnum-bog associations found in Finland are recorded, each named according to the main sp. of either layer. By combining ecologically equal associations a type system of Finnish sphagnum-bogs is produced, consisting of 9 sphagnum-bog types, each divided into 3-8 subtypes.—P. Mikola.

21395. Ramdas, L. A. (*Meteorol. Office, Poona, India.*) The micro-climates of plant communities. *Indian Ecol.* 1(1): 1-20. 1946.—Indian work is mentioned to show the presence of microclimates within pure communities such as standing crops and orchards; after which the author reviews the present position of the microclimate concept. The microclimates are classified on the nature and amt. of solar radiation reaching ground level, in which complications arise due to wind and other causes. Systematic observations on climates of various crops are mentioned, and one is compelled to notice the lacunae in our knowledge of large plant communities like forests.—B. A. Razi.

21396. Schulman, Edmund. (*U. Arizona, Tucson.*) Dendrochronologies in southwestern Canada. *Tree-Ring. Bull.* 13(2/3): 10-24. 3 fig. 1946/47.—Increment borings were taken from several trees at each of 6 localities in southern British Columbia (Quesnel, Williams Lake, Alkali Lake, Tranquille, Vernon and Penticton) and at Banff National Park, Alberta. Most of the trees sampled were *Pseudotsuga taxifolia* or *Pinus ponderosa*, growing in dry-type forests with average annual precipitation under 20 in., and near the north-

ern borders of their ranges where ring width sensitivity can be expected to be high. The rings of wood in each boring were measured and dated by the usual methods, including the determination of locally absent rings. The ages of the trees varied from about 200 to > 500 yrs. Cross-dating was very good between trees of both spp. and between mean ring widths for the several sites. The mean sensitivity of ring width (average change from yr. to yr. in the % departures of growth from trend) was fairly high but somewhat less than that for the same sp. in Colorado. It was good enough to provide, through the ring measurements from the various sites, a good tree-ring chronology along the dry belt of south-central British Columbia but the chronology at Banff was different. Rainfall during the 8 months preceding the growing season correlates well with the relative ring width for each yr. There is no correlation between growth rate and the mean temp. of June-July.—C. J. Lyon.

21397. Sisam, J. W. B., and R. O. Whyte. Establishment of vegetation on coal tips and other spoil mounds. *Nature [London]* 154: 506-508. 1944.—A preliminary discussion of the possibilities, now being seriously considered by reconstruction and planning authorities, of clothing unsightly and industrial spoil mounds with vegetation, preferably trees. A full statement of the information available from the literature and from local experience is shortly to be issued by the Imperial Agricultural Bureaus.—*Courtesy Hort. Absts.*

21398. Tolstead, W. L. Woodlands in northwestern Nebraska. *Ecology* 28(2): 180-188. 7 fig. 1947.—There are approx. one million acres of rough, stony land in n.-w. Nebraska covered with *Ponderosa* pine (*Pinus ponderosa scopulorum*) varying in density from a few trees per acre to dense groves with as many as 2,000 trees per acre. Most stands are now approx. 50 yrs. old, the virgin timber having been cut between 1880 and 1900. A few areas are covered with mature forest with 150 trees per acre. Groves approx. 50 yrs. old have 620 trees per acre. Mixed prairie grasses, especially *Bouteloua gracilis*, *Carex filifolia*, *C. heliophila*, and *Stipa comata*, cover the ground between widely spaced pines. In open woods *C. heliophila*, *Poa pratensis*, and *B. curtipendula* are most important. The ground layer of herbaceous plants is poorly developed in dense stands of pine. Deciduous trees grow in the bottoms of canyons along the creeks. The chief species are *Fraxinus pennsylvanica lanceolata*, *Acer negundo*, and *Ulmus americana*. *Celtis occidentalis*, *Salix amygdaloides*, and *Populus sargentii* are present also.—W. L. Tolstead.

21399. Weaver, J. E., and R. W. Darland. (*U. Nebraska, Lincoln.*) A method of measuring vigor of range grasses. *Ecology* 28(2): 146-162. 13 fig. 1947.—Vigor of the vegetation and its composition and density are the most important indicators among plants of the condition of the range. Pastures and ranges are now commonly classified as excellent, good, medium, and poor. Those of low grade, which result from too early use, too frequent use, and too close removal of the forage (but also sometimes from continued drought), are often the most abundant. Degeneration of excellent or good native pastures and ranges into medium or poor ones is always preceded by a decrease in vigor of the most nutritious and best-liked grasses. Differences in vigor of the same spp. under moderate and close grazing have been ascertained. Bunches or blocks of sod, about 6 × 6 inches and 4 inches deep, were selected for transplanting from overgrazed and moderately grazed pastures. The tops were removed and new tops and roots were grown during periods of 4 to 6 weeks in sandy loam soil in wooden boxes 10 × 10 inches by 24 inches in depth. These were lined with galvanized iron and one side was held in place by iron bands. New roots below the blocks were exposed by removing the side of the box and washing away the soil. *Bouteloua curtipendula*, *B. gracilis*, *Sporobolus cryptandrus*, *S. asper*, *Andropogon scoparius*, *A. furcatus*, *Buchloe dactyloides*, and *Panicum scribnerianum* were tested, often in duplicate or triplicate, and from widely distant stations. Dry wt. of new tops of weakened plants was 32% to 84% less than that of plants which had good to fair vigor. New roots were always shorter and less branched, and dry weight was 28% to 94% less than that of the controls. Leaves of non-vigorous plants averaged 15% to 41% narrower and av. diam. of new roots was 13-39% less. This test for vigor requires only 4-6 weeks. The new roots can be washed free of soil in 30 min.—J. E. Weaver.



21400. Woodbury, Angus M. (*U. Utah, Salt Lake City.*) Distribution of pigmy conifers in Utah and northeastern Arizona. *Ecology* 28(2): 113-126. 6 fig. 1947.—Studies were made of the pigmy conifer community (juniper-pinyon woodland) which included Utah juniper, *Juniperus utahensis*; one-seed juniper, *J. monosperma*; Rocky Mountain red cedar *J. scopulorum*; doubleleaf pinyon, *Pinus edulis*; and single-leaf pinyon, *P. monophylla*. This community was well distributed and occupied about 20% of the area studied. It occurred mainly between 5000 and 7000 ft. but extremes reached 3200 and 8400 ft. It formed a discontinuous vegetation belt, either mixed with or interrupted by sagebrush (*Artemisia tridentata*) in numerous places. The belt was bordered above by submontane shrubs (principally *Quercus gambelii*) and below by desert shrubs (sagebrush; black brush, *Coleogyne ramosissima*; and live oak, *Quercus* spp.). The distribution of pigmy conifers within these limits was explained not on the basis of climate alone but upon the interaction of all factors which affected availability of moisture to the plant. Increasing soil moisture at higher altitudes and decreasing moisture at lower altitudes combined with biotic competition from adjacent zones tended to set upper and lower limits, but aspect, slope, soil texture, soil cover all affected availability of moisture so that limits were far from uniform. Within the pigmy forest, sagebrush occupied the fine soils and the pigmy conifers the coarse, gravelly or rocky soils, which may be a farther expression of water availability. In a sandy area, the extra availability of water was about equivalent to adiabatic effects of 500 ft. in altitude.—A. M. Woodbury.

21401. Anonymous. Wiese im Sommer. Kleine Naturgeschichte einer bunten Lebensgemeinschaft. [Meadow in summer. A small natural history of a multicolored life-community.] *Universum* 1946(2): 36-37. 3 fig. 1946.

#### OCEANOGRAPHY

(See also Entries 21377, 21411A, 23649, 23650, 23654, 23668, 23669, 23671, 23672, 23673, 23674, 23675, 23676, 23677, 23678, 23680, 23690, 23691, 23697, 23699, 23700, 23703, 23704, 23705, 23724, 23726, 23757, 23831, 23832)

21402. Cheng, C. (*U. Aberdeen, Scotland.*) On the fertility of marine Cladocera with a note on the formation of the resting egg in *Evadne nordmanni* Loven and *Podon intermedius* Lilljeborg. *Jour. Marine Biol. Assoc.* 26(4): 551-561. 5 fig. 1947.—The present investigation is based mainly upon the material collected by Hardy from the Clyde Sea-Area in the summers of 1941 and 1942. The mean fertility of parthenogenetic ♀♀ varies with different spp.: *P. leuckartii* 2.6, *P. intermedius* 3, *P. polyphemoides* 4.7 and *E. nordmanni* 4.4; this is not correlated with the size of the species. Within the spp. *P. intermedius* and *E. nordmanni*, there exists, in general, a positive correlation between the size and the fertility of parthenogenetic ♀♀. The fertility of *E. nordmanni* is subject to seasonal variation; this is not correlated with fluctuations in the abundance of diatoms. An inverse relationship was observed in *E. nordmanni* between the reproductive capacity of parthenogenetic ♀♀ and the intensity of sexual reproduction. Some observations were made upon the formation of the resting egg in living specimens of *E. nordmanni* and *P. intermedius* obtained off Plymouth during the summer months of 1938, showing that in both spp. it commences with the tetrad stage of which the 3d oöcyte (counted from the anterior end of the ovary) is destined to become the resting egg, while the other 3 serve as nurse cells and finally disappear, being probably absorbed by the growing egg. In *E. nordmanni* a germarium, a slender tubular structure containing oögonia, was found attached to the posterior end of the tetrad.—C. Cheng.

21403. Dons, C. Marine boreorganismer. III. Vekst og voksemåte hos *Xylophaga dorsalis*. [Marine boring organisms. III. Growth and mode of boring by *X. dorsalis*.] IV. Tereido's angrep på forskjellige treslag. [IV. The attacks of Tereido on different sorts of wood.] V. De første borestadier hos Tereido. [V. Initial boring stages of Tereido.] VI. Forekomst av *Zirphaea crispata*. [VI. Occurrence of *Z. c.*] VII. Årsvekslinger hos Tereido. [VII. Annual variations in Tereido.] VIII. Tereido-angrepene avhengigheiter av treverkets struktur og stilling. [VIII. The relation between the attacks by Tereido

and the surface structure and orientation of the wood.] IX. Havvannets temperatur og peleormangrepene. [IX. The temp. of the sea water and the attacks by Tereido.] X. Vekstvariasjoner hos Tereido megotara. [X. Growth variations of T.] XI. Voksemåte hos Tereido norvegica. [XI. Mode of growth of *T. norvegica*.] XII. Tereido-hullene og tverrsnittet. [XII. The holes of T. in relation to the cross-section of the wood.] K. Norske Vidensk. Selskab. Forhandl. [Trondhjem] 13: 76-78. 2 fig. 1940; 14: 29-35. 3 fig. 1941; 138-140. 2 fig. 1941; 16: 118-120. 1943; 17: 40-42. 1 fig. 150-153, 177-180. 1944; 18: 182-189. 2 fig. 1945.—III. In the Trondheim Fjord *X. dorsalis* is occasionally present, together with *Tereido megotara*. It prefers fir wood to spruce, and wood of deciduous trees to either of them. The larvae have difficulties in establishing themselves on decorticated wood. They grow slowly during the first 2 mo. of their lives. In the course of a yr. the slender pear-shaped bore-hole may reach the length of 44 mm. IV. Expts. in the Trondheim Fjord show that while *Xylophaga* has a tendency to attack wooden blocks from the upper side, *T. megotara* prefers the lower side, vertical sides are attacked on a lesser scale, and the upper side almost not at all. Wood cut lengthwise will be attacked by *Tereido* in much greater number than wood cut across the fibers. Teak was not attacked at all, on any side. Then followed, according to number of larvae settled on the vertical sides of blocks (number per dm<sup>2</sup> in parentheses): Oak, ash (1.3); rowan, birch, alder, hickory, walnut, beech (1.5-2.9); hornbeam, mahogany (3.604); Norway spruce, Scotch fir, magnolia, pitchpine (9-18). If arranged according to size of bore holes (which tells more about the power of resistance of the various sorts of wood) hickory, hornbeam, and mahogany range nearly equal with ash, while the conifers and magnolia keep their place in the end of the series. V. Descriptions and drawings of *T. megotara* and *T. norvegica*. The latter sp. is very rare in the Trondheim Fjord in comparison with the former. VI. The typical substratum of *Zirphaea crispata* is clay but it may also make attempts on other material, e.g., wood, although unable to bore into wood. In the Trondheim Fjord most larvae come in August. VII. In the course of 15 yrs. of observation, 1928-1943, the attacks of *T. megotara* on blocks of wood immersed in the Trondheim Fjord varied greatly. The average number of larvae settling on the smooth under surface of test blocks varied from 1 to 200 per dm<sup>2</sup>, and the attack might come in June, July, or Aug. In yrs. of max. the parent individuals, which are proterandrous hermaphrodites, evidently reach maturity during a prolonged period, so that there are still many ♂♂ when others become ♀♀, while in min. yrs. most individuals change their sex simultaneously, the chance of fertilization thus being small. The cause of the difference in maturation is unknown. No correlation with hydrographic factors has been found. VIII. In expts. with wooden blocks, the larvae settle on smooth surface of wood cut longitudinally. A smaller number will establish themselves on rough, uneven surface of wood orientated the same way, while practically none will come on wood which has been cut across with a saw. IX, X. Although observations have been carried out in the course of 15 yrs., the influence of the temp. on the attacks of *Tereido* is not clear, probably because it is not the only factor of importance. The lowest winter temp. of the water has been 1.2°C, and the highest summer temp. 20.3°. A warm yr. will generally bring an early attack, and vice versa. The time from the attack in 1 yr. to the one in the next yr. may vary from 10 to 13½ months, which is the time required by a *T. megotara* to reach maturity. But individuals may become at least 15 months old. The length of the individuals varied from yr. to yr., but mostly they became reproductive when the longest individuals were about 50 cm. long. Exceptional individuals may be 90 cm. long. On the Norwegian coast, *T. navalis* is restricted to the southern part of the country. *T. norvegica* and *T. megotara* go at least as far north as Vardö; *T. megotara* is dominant in the fjords, at least at Trondheim, while *T. norvegica* has its main distribution near the open sea. When occurring together, the larvae of *T. norvegica* appear about 3 months later than those of *T. megotara*. Descriptions and drawings of anatomical details, initial stages, and bore-holes are given. A *T. megotara* may, after 3 months, have a diam. of 6 mm., a cross-section of 28 mm.<sup>2</sup>, and a volume of 1 cm.<sup>3</sup>, and after 6 months, resp., 10.5 mm., 86 mm.<sup>2</sup>, and nearly 20 cm.<sup>3</sup>.—O. A. Höeg.



21404. Fraser, C. McLean. General account of the scientific work of the *Velero III* in the eastern Pacific 1931-41. I. Historical introduction, *Velero III*, personnel. II. Geographical and biological associations. III. A ten-year list of the *Velero III* collecting stations. An appendix of collecting stations of the Allan Hancock Foundation for the year 1942. *Rept. Allan Hancock Pacific Exped.* 1(1/3): 1-424. 128 pl. 1943.—Part I describes the equipment of the *Velero III* and names its personnel. Part II illustrates and describes the geographical features and points out numerous biological associations that were encountered. Part III lists 1443 stations, established between 1933 to 1941, along the eastern Pacific from central California to Peru, and the appendix gives stations 1444 to 1502 for 1942, located in southern California and Oregon.—*Olga Hartman*.

21405. Garth, John S. Geographical account and station records of *Velero III* in Atlantic waters in 1939. *Rept. Allan Hancock Atlantic Exped.* 1: 1-106. 28 pl. 1940.—This describes 59 stations in eastern tropical America. Ten hydrographic charts are given and 28 plates show typical areas investigated.—*Olga Hartman*.

21406. Hardy, A. C., and W. N. Paton. (*Univ. Coll. Hull and Marine Sta., Millport, Eng.*) Experiments on the vertical migration of plankton animals. *Jour. Marine Biol. Assoc.* 26(4): 467-526. 4 pl., 20 fig. 1947.—Expts. were made with special apparatus to study vertical movements of plankton animals at various depths in the sea. Apparatus No. 1 consists of 2 vertical glass cylinders having swivelling circular trapdoors at their middles which can divide each into upper and lower compartments. The trapdoors are closed at beginning of expts. and planktons introduced into one compartment of each cylinder; in standard expts. into upper in one and lower in the other. Apparatus having been lowered on wire to required depth, the trapdoors are opened by messenger weight sent down wire to strike trigger mechanism; planktons are now free to move up or down whole length of cylinder. After 1 or 1/2 hr., the expt. is ended by 2d weight sent down to close trapdoors and apparatus is brought to surface for contents of each compartment to be preserved and counted. Thus the percentages of populations of different spp. moving up or down under different conditions of light, depth, etc., can be experimentally detd. Expts. made at depths of 1, 5, 10, 20, 30 and 40 m. showed that populations of copepod *Calanus* segregated into those moving upward and those moving downward, and that their respective proportions on an average increased and decreased in a straight line correlation with depth. Expts. at 50 and 100 m. were too few to give conclusive results. Mirror expts. in which natural overhead illumination was reflected upwards from below into an otherwise darkened cylinder showed light to be an important factor. It is towards or away from light that *Calanus* moves, rather than in response to gravity. Expts. repeated at 3 hr. intervals at 10 m. depth showed a marked change in behavior of *Calanus* through a 24-hr. period: an upward movement with approach of night and a downward one with approach of day. A few expts. with apparatus No. 2 consisting of a long glass cylinder divided by controlled trapdoors into 7 compartments enable the vertical migrational behavior of *Calanus* to be analyzed in greater detail. A few expts. made in complete darkness are puzzling and require confirmation. Further work is in progress to extend expts. and test various hypotheses.—A. C. Hardy.

21407. Harvey, H. W. (*Marine Biol. Assoc., Plymouth, Eng.*) Manganese and the growth of phytoplankton. *Jour. Marine Biol. Assoc.* 26(4): 562-579. 2 fig. 1947.—Inshore water collected near Plymouth during the late summer and autumn of 1945, after enrichment with nitrate, phosphate and iron, did not support continued growth of a species of *Chlamydomonas*, of *Chlorella*, of a Cryptomonad and of 2 spp. of Chrysomonads. Addition of 0.5-2 mg. Mn<sup>++</sup> or Mn<sup>IV</sup>/m.<sup>3</sup> allowed vigorous growth and the production of heavy crops. The effect on *Chlamydomonas* of adding as little as 0.1 mg./m.<sup>3</sup> was apparent. The growth of *Coscinodiscus eccentricus* varied in waters collected from inshore and from offshore which had been similarly enriched with N, P and Fe. Addition of Mn had only a minor effect. Addition of other microelements to inshore waters enriched with N, P, Fe and Mn did not affect growth rate of *Chlamydomonas*. Mn starvation led to the production of small *Chlamydomonas* cells, and caused a resting condition or lag period in *Chlorella*. A sup-

ply of Mn alone was insufficient for recovery; a period of illumination was also required for internal changes to take place before logarithmic growth was resumed. Addition of Mn was effective when either nitrate or ammonium was supplied as source of N, in dim, bright, continuous, or discontinuous illumination. Metabolic products which leached out of the cells into the water during the growth of both *Chlorella* sp. and of *Nitzschia closterium* acted as a growth stimulant. Mn at great dilution is rapidly 'collected' from solution by *Chlorella*. During growth this alga abstracts a material proportion from water containing 5 mg. Mn/m.<sup>3</sup>. Using *Chlamydomonas* as 'analyst', it was found that added organic detritus, or the corpses of marine bacteria, adsorbed a material proportion of the Mn in sea water containing 1-2 mg. Mn/m.<sup>3</sup>.—H. W. Harvey.

21408. Lebour, M. V. (*Marine Biol. Assoc. U. K., Citadel Hill, Plymouth, Eng.*) Notes on the inshore plankton of Plymouth. *Jour. Marine Biol. Assoc.* 26(4): 527-547. 1 fig. 1947.—Records of spp. of Decapoda, Mollusca, and Annelida, with a few other organisms, chiefly larvae, in the inshore waters of Plymouth during the years 1940-1945. References are given to descriptions of the separate spp.—M. V. Lebour.

21409. Muller, F. M. On the sensitivity of Barnacles, in different stages of development, towards some poisons. *Arch. Néerland Zool.* 4(2/3): 113-132, 1940.—The sensitivity of Nauplius larvae, Cypris larvae and adults of *Balanus crenatus* and *B. balanoides* to copper, formaldehyde and chlorine was investigated. Nauplii are completely killed by 30 mg./l. of Cu (in form of CuSO<sub>4</sub>), the small adult individuals by 10 mg./l. of Cu during 2 hrs. The animals show greater resistance to CH<sub>2</sub>O and Cl, because these substances can be easily transformed into relatively harmless compounds.—J. E. W. Thle.

21410. Rakestraw, Norris W., and Theodor von Brand. (*Woods Hole Oceanogr. Inst., Mass.*) Decomposition and regeneration of nitrogenous organic matter. VI. The effect of enzyme poisons. *Biol. Bull.* 92(2): 110-114. 1947.—The appearance and disappearance of ammonia and nitrite in decomposing plankton in sea water were studied, and the effects noted of such enzyme poisons as cyanide, fluoride, arsenic, iodoacetate, and carbamates. Nitrite formation was either prevented or stopped by all agents used in sufficient conc. Ammonia formation was retarded, at least, by cyanide and iodoacetate, but not by fluoride. The nature of the possible enzyme systems is discussed.—*Authors*.

21411. Scheer, Bradley T., and Denis L. Fox. (*Scripps Inst. Oceanogr., La Jolla, Calif.*) Attachment of sedentary marine organisms to petrolatum surfaces. *Proc. Soc. Exptl. Biol. and Med.* 65(1): 92-95. 1947.—Petrolatum delays or prevents attachment of sedentary marine organisms to submerged surfaces. This property is not consistently altered by changes in consistency, produced by dilution with miscible substances, or changes in wettability, produced by incorporation of wetting agents. Marked alterations in the antifouling efficacy of petrolatum are produced by incorporation of certain compounds, notably aliphatic sulfonates. The activity of these substances is related to their orientation, and presumably their ionization, at the petroleum-water interface.—B. T. Scheer.

21411A. Thomson, J. M. The fauna of the algal zone of the Swan River estuary. A preliminary survey of Freshwater Bay with notes on the chief species. *Jour. Roy. Soc. Western Australia* 30: 55-73. 1943/1944(1946).—The fauna occurring in 6 spp. of algae was investigated. The spp. of algae varied in abundance and none was present in all 10 mos. of the survey. Some 52 spp. of animals were recorded as members of the algal community. These occurred in varying abundance at different times of the yr. The max. number of spp. occurring in any mo. was 33, the min. 6. Population density and species density are shown for each sp. of alga. Population density, species density, amt. of diatoms present, and abundance of algae were all lowest in Aug.-Sept. The dominant spp. in each month are listed. The nature of the spp. present changed as the salinity dropped during heavy winter rains. As summer returned, the summer members of the fauna returned with the increasing salinity, *Caprella* spp. being the only spp. common in late summer collections which had not returned by Dec. It was found that the top 4 inches or so of the algae were not favored, but most spp. were taken

between 4 in. and 2 ft. A list of occasional intruders into the algal community is given. Added are ecologic and systematic notes on the chief spp. A graph summarizes the variation in population density. Besides the figures for each sp. of alga, an estimated mean is given which is the average reading of the different algae present at the time, their relative abundance being ignored except at the point A. The reading at this point represents the figure for *Cladophora pentillata* only since this was in vast abundance, whereas the other spp. recorded at this time were present in extremely small widely-scattered clumps. The reading for *Cladophora* thus gives a much more accurate picture of the algal fauna. 2 crops of *Ulva lactuca* occur during the yr. *Cystophyllum muricatum* was not collected in Aug., and in Sept. only a small specimen was found, after which none occurred. The dates of appearance and disappearance of other algae can be seen from the graph. A tremendous increase in animal population is indicated in Nov. It can be seen from the graph that the summer population is several times greater than in mid-winter.—*Auth. summ.*

### LIMNOLOGY

(See also Entries 21371, 21392, 23090, 23621, 23639, 23642, 23645, 23655, 23661, 23666, 23682, 23687, 23695, 23769, 23771, 23772, 23773, 23855)

21412. Alm, Gunnar. Beiträge zur Kenntnis der Limnologie kleiner Schwinguferseen. [Contribution to the knowledge of the limnology of small lakes with floating shores.] *Arch. Hydrobiol.* 40(2): 555-575. 1943.—Schwinguferseen are small lakes which derive their name from the floating Carex-Sphagnum carpet usually making up their immediate shores. They are rare in Europe proper but are common in the wooded coastal region of northern Sweden. The 15 lakes reported on in this study varied in area from 0.8 to 11 ha., in depth from 1.1 to 3.8 m., in color from bright yellow to reddish-brown, and in pH usually from 6 to 6.5. The outline of lakes of this type is roughly circular. The surrounding Carex carpet is sometimes rooted in solid ground, sometimes in the loose dyggtjja of the lake basin, and frequently grows out over the surface of the water, forming steep or convex banks with a drop off up to 2 m. at the edge of the water. This method of bank formation reduces or even obliterates the littoral zone with its associated flora and fauna, and results in a high surface area to depth ratio. The steepness of the shores and relative uniform depth of the bottom, negligible turbulence from surface water exchange, and protection from winds afforded by the forests just outside the bog and moor mat produce marked stratification of temp. and oxygen. In summer there was a well-developed metalimnion (thermocline) at a depth of 2-4 m., or even at 1-2 m. in the smallest lakes. Temp. of the epilimnion varied from 16 to 21°C, and of the hypolimnion from 4 to 5°C. The volume ratio H/E was often large, sometimes > 1 as in oligotrophic lakes. Oxygen was usually lacking in the hypolimnion and lower portion of the metalimnion, a condition resulting not from any eutrophic nature of the lakes, but rather from the high O<sub>2</sub> demand of the allochthonous organic material and of the surrounding shores, and from the low O<sub>2</sub> content of the inflowing ground water. A few series of samples collected in late winter showed several of the lakes completely devoid of oxygen. Fish production, although low, can probably be increased by introduction of suitable spp. into some of the lakes. 8 of the 15 lakes contained no fish; 4 had only slowly-growing perch; 2 had perch, pike, and roach; and the largest lake had coregonids in addition to these. Presence or absence of fish is detd. primarily by the oxygen relationships of the water. These lakes are important in supplying fish to the inhabitants of the region.—*D. G. Frey.*

21413. Behre, K., and E. Wehrle. Welche Faktoren entscheiden über die Zusammensetzung von Algengesellschaften? Zur Kritik algenökologischer Fragestellungen. [What factors are decisive for the composition of alga societies? Criticisms concerning questions on the ecology of algae.] *Arch. Hydrobiol.* 39(1): 1-23. 1 fig. 1942.—The authors independently investigated alga societies of different localities near Bremen, in the Schwarzwald, and in the Upper Rhenish plain. At first their results seemed to show some discrepancies, but it was possible to reach agreement by considering the relations between the H-ion and those of the nu-

tritive salts as limiting factors in the development of algae. The selecting factors in aquatic societies may be revealed either exptly. by cultures kept under various conditions, or by statistical methods, observing a great number of different biotopes. All recent investigators have considered pH to be of great importance; yet any given value of the pH may be caused by very heterogeneous circumstances, and it is possible, therefore, that quite different societies may live at the same H-ion conc., as is the case in the "Truper Blänken", a group of shallow ponds near Bremen. Although communicating by ditches, so that the algae could pass from one basin into the others, and pH being practically equal in all ponds, the alga societies were different because the amt. of dissolved salts differed. On the other hand, uptake of salts by the cells depends not only on the conc. of their ions, but also on the pH, which alters selective permeability of the cells. Equal amts. of nutritive salts combined with different pH values therefore produce different societies. However, certain pH-values correspond to certain amts. of dissolved salts in most cases, so that the 2 chief characteristics of aquatic biotopes generally act as if they were a single factor.—*Ingo Findenegg.*

21414. Brooks, John L. (Yale U., New Haven, Conn.) Turbulence as an environmental determinant of relative growth in *Daphnia*. *Proc. Nation. Acad. Sci. U. S. A.* 33(5): 141-148. 2 fig. 1947.—Preliminary expts. on a cyclomorphic race of *D. longispina* indicate that turbulence of the water is one of the environmental factors controlling relative rate of helmet growth during postnatal life.—*Auth. summ.*

21415. Budde, Hermann. Die benthole Algenflora, die Entwicklungsgeschichte der Gewässer und die Seetypen im Naturschutzgebiet "Heiliges Meer". [The benthal algae flora, the development of waters and lake-types in the "Heiliges Meer National Park."] *Arch. Hydrobiol.* 39(2): 189-293. 18 fig. 1942.—Several lakes (Heiliges Meer, Brdfallsee, Heideweiher) and small pools in n.-e. Germany were studied as to the bottom flora. These basins were formed by a collapse of cavities, the salt layers in the underground having been washed out. They are situated in a dry *Calluna* heath and show oligotrophic or dystrophic properties. In some cases the water contained considerable amts. of Fe, but this fact did not influence quality and quantity of alga societies. The littoral Macrophyta are represented by *Phragmites*, *Scirpus*, *Typha*, *Carex*, *Littorella* and *Sphagnum*. The societies of Microphyta were studied by estimating number and covering degree according to the methods of Braun-Blanquet, somewhat varied for microscopical practice. As it is difficult to spread homogeneously the algae scraped from the substratum, the method of exposing cover glasses for some weeks in different strata of the lakes was used. This is an excellent way of comparing the production of different lakes. The vertical zonation of the growth was studied chiefly on the stalks of *Scirpus*. Among the ecological factors, pH and dissolved carbonate chiefly control the development of the societies. Most algae live at pH 6.7-7.3. Only a few spp. can stand values < pH 5, esp. Desmidiaceae (*Penium*, *Closterium*, *Euastrum*, *Tetmemorus*, *Micrasterias*) and some diatoms (*Pinnularia*, *Eunotia*). The majority of Desmidiaceae prefer a pH of 6.7-6.8, the number of spp. decreasing at lower or higher values. Societies composed of Desmidiaceae are favored by intense light and cannot stand desiccation. Most diatoms, however, develop optimally in alkaline water, although acidophil and indifferent forms also are found. Tetrasporales, Protococcales and Cyanophyceae generally prefer pH values > 7, except some acidophil Cyanophyceae.—*Ingo Findenegg.*

21416. Dunford, E. G., and P. W. Fletcher. Effect of removal of stream-bank vegetation upon water yield. *Trans. Amer. Geophys. Union* 28(1): 105-110. 1947.—Vegetation has been cut along the stream bank of a 22-acre watershed on the Coweeta Exptl. Forest (Appalachian Forest Exptl. Station, Asheville, N. C.). The water yield had been observed before and after the riparian vegetation was removed. Transpiration losses as a consequence of bank vegetation not only cause a clear diurnal fluctuation of the outflow but also are responsible "for a progressive drain on the ground water reservoir in excess of that which would normally occur if there were no transpiration." The superdischarge, after cutting vegetation, amounts to 4-19% and can be of much practical value.—*V. Conrad.*



21417. Grohs, Hans. (Reichsanst. f. Fischerei, Wien-Kaisermühlen, Austria.) Limnologische Untersuchung zweier Donaualtwässer bei Wien. [Limnological studies on two standing waters in old river branches of the Danube near Vienna.] *Arch. Hydrobiol.* 39(3): 369-402. 11 fig. 1943.—The "Karpfenwasser" and "Eppelwasser" were studied physically, chemically and biologically in 1936 and 1937. Both ponds are influenced by the ground water, its level rising and falling with the Danube's. By this fact the relatively low temp. of the bottom water is caused in summer as well as mixing up the water layers in several periods of the yr. The largest amts. of  $\text{NH}_4$  and  $\text{NO}_2$  occurred in winter. In summer the superficial layer was sometimes colored by *Aphanizomenon gracile* and Chlorophyceae. Some cold-stenotherm algae, e.g., *Cryptomonas brevis* and *Rhodomonas lacustris*, developed also in summer at higher temp., their population exceeding in number those of the winter maximum. It could not be detd. whether the summer forms were different ecological types or whether they developed atypically under peculiar circumstances in the habitat, a cold hypolimnion being absent in these shallow ponds.—Ingo Findenegg.

21418. Harnisch, Otto. Ein Gesichtspunkt für die Oekologie der Hochmoor-Wasserfauna. [A point of view concerning ecology of the water fauna in high moors.] *Arch. Hydrobiol.* 39(3): 418-431. 1943.—Some groups of animals, especially Oligochaeta, Hirudinea, Ostracoda and Mollusca, most insect larvae, and Pisces, are absent in the bog water of high moors. This was thought to be due to an injurious effect of humic acids or of the H-ion conc. Another possible explanation is suggested by the results of recent expts. on osmotic- and ion-regulation in animals by active absorption of ions. It is evident that though many spp. are unable to compensate the loss of salts effected by hypotonic media, others can do so. Some of them possess special organs for ion-absorption, e.g., the anal papillae of Diptera larvae. It is not surprising, therefore, that a great many aquatic animals are unable to live in waters so poor in salts as bog water. Only those will occur that either require very small amts. of salt, their haemolymph being marked by exceptionally low ion-conc., or are able to exploit actively the scanty salt content of the medium. Parenteral ion-absorption from the food may be of importance.—Ingo Findenegg.

21419. Hooper, Frank F. (U. Minnesota, Minneapolis.) Plankton collections from the Yukon and Mackenzie River systems. *Trans. Amer. Microsc. Soc.* 66(1): 74-84. Map. 1947.—Summer plankton was studied from a previously poorly investigated area in northern British Columbia, Yukon Territory, and Alaska. Samples from 23 lakes, ponds, and rivers were analyzed. Large numbers of diatoms were found to be characteristic of phytoplankton of these waters. Rotifers and dinoflagellates were the predominant zooplankters. Additional N. American records for the copepods *Cyclops strenuus*, *Diapionus denticornis*, and *Heterocope septentrionalis* are given.—F. F. Hooper.

21420. Hutchinson, G. Evelyn (Yale U., New Haven, Conn.), and Vaughan T. Bowen. (Amer. Mus. Nat. Hist., N. Y. C.) A direct demonstration of the phosphorus cycle in a small lake. *Proc. Nation. Acad. Sci. U. S. A.* 33(5): 148-153. 1 fig. 1947.—Radioactive P was released on the surface of a stratified lake in which virtually no mixing takes place. Counts of radioactivity of water at different levels a week later indicate a tendency for the P to descend to deeper levels.—G. W. Lasker.

21421. Maucha, R. Das Gleichgewicht des limnischen Lebensraumes. (Ein Versuch, das Holocen als Schwingungssystem darzustellen.) [The equilibrium of limnetic biotops. (An attempt to consider the holocen as an oscillatory system.)] *Arch. Hydrobiol.* 39(1): 24-62. 1942.—As biotops and biocenoses in lakes act reciprocally, both may be considered as a totality, the "holocen." The author treats this totality as an oscillatory system in which all processes transforming substance and energy are cyclic or reversible so that a dynamic equilibrium is established. Mutual actions and reactions, however complicated they may be, can be involved in the chief process expressed by the well known equation:  $6\text{CO}_2 + 5\text{H}_2\text{O} + 685,000\text{ cal.} \rightleftharpoons \text{C}_6\text{H}_{10}\text{O}_5 + 6\text{O}_2$ . The cycle begins with the photosynthetic action of the producers (algae) which form organic compounds. In lakes they are chiefly represented by the nanoplankton. The lake water may be regarded, therefore, as a macroheterogenous

system in which, according to Nernst and Brunner, the velocity of chemical processes depends on the diffusion of  $\text{CO}_2$  into the cells. Evidence is given by calculations that this fact not only limits the production, the amt. of free  $\text{CO}_2$  decreasing to a minimum by the increase of cells, but also causes the phenomenon of an optimal value of photosynthesis at about  $20^\circ\text{C}$ , as the velocity of diffusion diminishes with increasing temp., although synthesis within the cells is favored by it according to van't Hoff's Law. As to the intensity of light, the author showed exptly. that even in arctic zones the optimal value for assimilation is realized in summer, therefore in no region of the earth will it be a limiting factor of production. The surplus of radiation, "inactive light" in the tropics and in temperate zones, is not injurious, as the algae there develop in deeper strata of the lakes. Contrary to the general opinion, the consumers (animals) are not thought to share considerably in decomposition. They rather conserve the organic substance, protecting it from the activity of the reducers, and bring dead matter in a living form again as do the detritus-eaters. Thus the amt. of living substance in lakes will be a multiple of that existing in producers, the latter being limited by the quantity of  $\text{CO}_2$  at their disposal. The reducers do not affect living substance, but decompose dead matter only, reversing the process of photosynthesis and establishing thus the equilibrium of the holocen.—Ingo Findenegg.

21422. Moelder, Karl. Die regionale Verteilung der Seetypen in Estland. [The regional distribution of lake types in Esthonia.] *Arch. Hydrobiol.* 39(3): 403-414. 1943.—The author investigated 206 (i.e., 13%) of the lakes in Esthonia and gives a survey of the regional distr. of 4 chief types. The eutrophic lakes are in most cases characterized by dense Scirpeto-Phragmiteta and a richly developed phytoplankton. They occur frequently in the southern regions. The alkalitrophic type, resembles the first group, but shows less vegetation of macro- and microphyta. It is limited to an environment of Silurian limestone in the northern regions. Dystrophic lakes are spread over the whole country, being most frequent in the center which is covered with large bogs. The oligotrophic type, characterized by a Horal *Lobelia-Isoteles* association, is rare in Esthonia. Compared with similar lakes in Fennoscandia, the Esthonian lakes contain more nutritive salts in soln.—Ingo Findenegg.

21423. Österlind, Sven. (U. Uppsala, Sweden.) Growth of a planktonic green alga at various carbonic acid and hydrogen-ion concentrations. *Nature [London]* 159(4032): 199-200. 1 fig. 1947.—*Scenedesmus quadricauda* was grown in basic nutrient, under standard conditions, with carbonate-bicarbonate buffer adjusted by adding  $\text{CO}_2$ . Growth was measured photometrically, the carbon deposition estimated from pH change after 20 hrs. of illumination. Neither carbon nor phosphate was limiting. Nitrate not only gave more growth than ammonium at each pH level from 7 to 11, but at pH 9.5 and above, growth in ammonium fell very rapidly. With either nitrate or ammonium, the pH rose during growth, but faster with nitrate, in accordance with the rate of use of  $\text{CO}_2$ .—R. Walker.

21424. Schallgruber, Franz. Das Plankton des Donauströmes bei Wien in qualitativer und quantitativer Hinsicht. [The plankton of the Danube near Vienna as to quality and quantity.] *Arch. Hydrobiol.* 39(4): 665-689. 2 fig. 1944.—At 2-week intervals, water samples were taken in 1932-33 and supplementary tow-nettings were made. The potamoplankton was composed of 90 spp. of algae and 25 of animals, but only a small number of them were frequent. In winter *Synedra ulna* and *Asterionella formosa*, in summer *Fragilaria crotonensis*, *Endorina elegans* and some other Chlorophyceae and Rotatoria were characteristic. *Cyclotella* spp. occurred most frequently in all seasons. Thus the Danube carries a Bacillariophyta-Rotatorian plankton as do other European rivers. Quantitatively, almost equal amts. of cells occurred just as found by Kofoid in the Illinois River. Maxima were observed in spring and autumn with falling water-level. Hence it is concluded that the planktic organisms had been washed out from ponds and pools in old river-branches. Nevertheless, some forms seem to multiply in running water, also. The potamoplankton may therefore be considered as a heleoplankton somewhat modified by the selecting effect of the rate of flow.—Ingo Findenegg.

21425. Seckt, Hans. Estudios hidrobiológicos hechos en la Mar Chiquita. [Hydrobiological studies made in the



Mar Chiquita, Argentina.] *Bol. Acad. Nacion. Cienc. [Córdoba]* 37(3/4): 279-309. 4 pl. 1945.—In the n.-w. of the Prov. of Córdoba there is a wide depression of the soil, about 86 m. above sea level, which is occupied by a salt lake called the Mar Chiquita, its east-west dimensions being about 75-80 km., and its north-south dimensions between 10 and 26 km., making a total surface of about 1700-1800 sq. km. The lake is caused by the inflow of several rivers into a region where there is no outlet, and the volume is maintained by evaporation. As the soil around the lake is salty, many of the plants represented there are typical halophiles: *Suaeda*, *Sesuvium*, *Salicornia*, *Glinus*, *Chenopodium*, *Atriplex*, *Spirostachys*, *Amarantus* and others. The statement of some geographers that the depth is 34 m. is erroneous, the depth really being 3-4 m. in some places, and usually not more than 2 m. The reaction of the water is alkaline, with a pH generally 7.6, but sometimes 7.9-8.4, especially when the water is taken from the bottom of the lake. The water seems sometimes clear, but sometimes visibility extends only to a depth of 26-27 cm. This is caused by the presence of abundant plankton and especially decaying remains of the crustacean *Artemia*. At times a gigantic parabolic line is perceived moving over the surface of the water, and investigation shows it to be formed of countless individuals of larval *Artemia*, moving together, perhaps because of a puff of wind. The black mud on the bottom of the lake is chiefly formed by remains of this sp., which feeds on Cyanophyceae and Chlorophyceae brought from the shore, and which themselves obtain the necessary carbon anhydride from the Crustacea. Bacteria and thiobacteria find abundant nourishment. The most interesting phytophysiological fact is that most of the algae are freshwater forms which have been able to adapt themselves to the high salt conc. of the lake, after being brought in by the rivers, and show no sign of finding the new environment unfavorable. The systematic part of the paper includes notes as to abundance and descriptive data on 6 spp. of Eubacteria, 8 spp. of Thiobacteria, 4 spp. of Schizophyceae or Cyanophyceae, 16 spp. of Hormogonales, 17 spp. of Diatomeae, and 7 spp. of Chlorophyceae, with no new spp. The plates show over 50 figs.

21427. Wilcox, Charlotte E. (Illinois State Normal U., Normal.) Simplified method for measuring dissolved oxygen in streams. *Trans. Illinois Acad. Sci.* 39: 67-69. 1947.—The regular Winkler Method and other methods as given in Standard Methods for the Experimentation of Water and Sewage are not suitable for field work and involve laboratory resources and techniques not available in stream analysis.—Greta Oppe.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 21377, 21411, 21412, 21427, 21442, 22527, 23045, 23621, 23692, 23834, 23835)

21428. Aplin, J. A. (State Fish. Lab., Terminal Island, Calif.) The effect of explosives on marine life. *California Fish and Game* 33(1): 23-30. 2 fig. 1947.—A series of observations and expts. were performed to determine damage to fish and other marine life from the use of explosives in geophysical survey work to locate oil deposits. Of the fish killed, anchovies, kingfish, sardines, queenfish and smelt made up 90% of bulk, due presumably to the fact that these spp. occurred in greatest numbers in the areas where the geophysical survey was made. Post mortem examinations showed that air bladders burst in those spp. that have them. In addition, most individuals showed ruptured blood vessels and, in some cases, the viscera was crushed and the ribs broken. Some fish are apparently stunned but recover. Numerous spp. of fish, as well as lobsters and abalones, were placed in cages, made of welded iron frames covered with galvanized wire hardware cloth, and subjected to explosions at various distances. There is no apparent relation between depth of water or size of explosive charge and the wt. of fish killed. The more shots fired, the greater the kill because of the greater chance that fish will be in the area. Shots closest to shore produce most dead fish as fish are more abundant just outside the surf. Fish with air bladders are much more likely to be killed than those without. Explosions do not appear to harm lobsters but abalones may be damaged. Explosions do not appear to frighten schooling fish from the area. Seismic survey work at sea should be scheduled when the fish population is at a minimum if such times can be detd.—J. F. Janssen, Jr.

21429. Aplin, J. A. (State Fish. Lab., Terminal Island, Calif.) Pismo clams of San Quintin, Lower California. *California Fish and Game* 33(1): 31-33. 2 fig. 1947.—Since 1941, Pismo clams (*Tivela stultorum*) dug and shucked on beaches of the Lower California Peninsula (Mexico) have been shipped by boat and truck under refrigeration to canneries in the Long Beach-Los Angeles Harbor area. Observations on the gathering and prepn. for shipment of the clams at San Quintin, a representative beach, are presented.—J. F. Janssen, Jr.

21430. Auvergnat, R., and M. Secondat. [Influence of the variations in salinity on the osmotic pressure of the vesicles of the fry of migratory salmon (*Salmo salar* L.).] *Bull. Inst. Océanogr. [Monaco]* 805. 1-7. 1941.—Osmotic pressure of the fry of the migratory salmon (*Salmo salar*) at the stage prior to the resorption of the umbilical vesicles was measured in the vesical fluid after the fry had been in water containing known concs. of NaCl for a min. of 7 hrs. Cryoscopic readings were made and translated into NaCl equivs. The osmotic pressure of the vesicles of salmon fry in fresh water was equiv. to 9.9/1000 of NaCl ( $\Delta - 0.61^\circ$ ) and is clearly more elevated than that of other teleosts of the same habitat. The osmotic pressure of the fry becomes notably augmented with increased conc. of the external medium and never shows hypotonicity to the latter. During the 2d period when the umbilical vesicle is nearly resorbed, the fry behave as euryhaline fish. The osmotic pressure of the internal medium varies much less than the variations made in the surrounding medium, e.g., when the external medium has a NaCl conc. of 12.5/1000 the internal medium becomes hypotonic. Thus in the 2d phase the fry manifests an independence of the osmotic pressure of the external medium.—Eva G. Shipley (courtesy Chem. Absts.).

21431. Lloyd, A. J. (U. Bristol, Eng.), and C. M. Yonge. (U. Glasgow, Scotland.) The biology of Crangon vulgaris L. in the British Channel and Severn Estuary. *Jour. Marine Biol. Assoc.* 26(4): 626-661. 20 fig. 1947.—Measurements were made of 22,000 ♀ and 6000 ♂ *C. vulgaris* collected throughout the yr. from the shrimp fisheries of the Severn Estuary and Bristol Channel. Wide range of temp. can be withstood but, though euryhaline, *C. vulgaris* cannot withstand low salinity combined with low temp., the ♂♂ being more affected than the ♀♀. Appreciable growth does not occur in the winter and there is no length increase when ♀♀ moult from the 'neuter' to the egg-carrying condition. Secondary sexual characters are described. Females become mature at lengths of about 45 mm. in the Channel and of 50 mm. in the Estuary. Copulations, spawning and egg-carriage are described. There are probably 2 spawning periods, in spring and summer, in the Channel and one, later in the spring, in the Estuary. After the 1st yr., the ♀♀ grow faster; they also live longer than ♂♂, maximum lengths being > 80 mm. and 70 mm., respectively. In the Channel the ♀♀ probably spawn once only in the 2d yr., twice in the 3d and 4th yrs., and a few may survive to the 5th yr. In the Estuary spawning is apparently confined to the 3d and 4th yrs. There is a seaward winter migration, especially from the Estuary where ♂♂ disappear; ♀♀ return first in the spring, but migrate seaward again for hatching.—C. M. Yonge.

21432. McLaren, Barbara A., Elmer F. Herman, and C. A. Elvehjem. (U. Wisconsin, Madison.) Nutrition of Trout: Studies with practical diets. *Proc. Soc. Exptl. Biol. and Med.* 165(1): 97-101. 1947.—A practical meatless ration for trout containing 55% plant material is described which is essentially equivalent to a standard liver, canned carp diet so far as growth and hemoglobin levels are concerned. The effect of various substitutes in the ration is described. Although the ration contains 45% carbohydrate, liver enlargement was not noted except when sprouted soybeans or poor quality yeast was included. Large scale field trials indicated that Ration C was superior to pork spleen, and equivalent to pork spleen supplemented with canned carp, as a diet for yearling brook trout on the basis of both growth and mortality.—B. A. McLaren.

21433. Sigurdsson, G. J. (Iceland Fish Indus. Bd., Reykjavik, Iceland.) Salting herring in Iceland. *Food Indust.* 19(4): 449-452. 1947.—Herring fisheries are of great economic importance to Icelanders who catch 200,000 to 300,000 tons annually. Herring caught off Iceland average

11.5 yrs. old, 385 gm., 57 vertebrae and 18.2% body fat. Most are caught by purse-seines, some by driftnets. Bulk of catch goes to reduction plants (5000 tons capacity daily). Best prices come from salted herring, cured in open-air stations where 53 to 62 lb. salt per 220 lb. of fish are used. "Matjes" herring is preferred in the U. S. and is not as salty. "Kryddsild" is a spiced herring used in hors d'oeuvres, generally packed in 5-lb. cans. Rancidity causes the greatest spoilage of salted herring.—R. S. Harris.

21434. Vestal, Elden H. (*California Div. Fish and Game, San Francisco*.) A new transplant of the Piute trout (*Salmo clarkii seleniris*) from Silver King Creek, Alpine County, California. *California Fish and Game* 33(2): 56-59. 1 fig. 1947.—Survey of the North Fork of Cottonwood Creek in the White Mts. of eastern Mono Co., Calif., July 3, 1946, indicated in this tributary, a stream barren of fishlife, possibilities for a new and remote sanctuary for the Piute trout, whose numbers recently have been decimated by poachers in its native Upper Fish Valley, Alpine Co., Calif. Following location of trout for the transplant, 407 fish of all sizes were captured on Aug. 21st and 22d, 1946. Next day, 401 survived for planting in the North Fork of Cottonwood Creek.—E. H. Vestal.

21435. Watts, R. L., and G. W. Harvey. (*Agric. Expt. Sta., State College, Pa.*) Temperatures of Kettle Creek and tributaries in relation to game fish. *Bull. Pennsylvania Agric. Expt. Sta.* 481. 1-30. 11 fig. 1946.—Kettle Creek and its tributaries drain an extensive and important wooded area in Central Pennsylvania. Numerous temps. were recorded to determine the most suitable habitats of the streams for small-mouthed black bass (*Micropterus dolomieu*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*S. gairdnerii*). Summer temps. fluctuate greatly in most of the areas of the Kettle Creek system. 66°F is the ideal summer temp. for brook trout while 70° or slightly higher is preferred by brown and rainbow trout. For about 4 months of the summer season the main stream, Kettle Creek, is too warm for any sp. of trout, but is suitable for small-mouthed black bass. The migratory movement of trout to the colder tributaries begins the latter part of May. All the tributaries provide suitable temps. for brook trout but the head waters of some of them are too cold to attract brown trout. In most of the tributaries, brown trout are found with brook trout in the warmer lower areas while brook trout is the only species of trout in the colder upper parts of the streams.—R. L. Watts.

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 21378, 23289, 23600, 23865, 23869, 23872, 23882, 23883, 23888, 23896, 23900, 23901)

21436. Adametz, Leopold. Der Arterhaltung dienende Massenwanderungen und instinktbefindliche Regulierung der Fruchtbarkeit und der Nachkommenschaft im Tierreich. *Zeitschr. Zücht. Reihe B: Tierzücht. u. Züchtungsbiol.* 49: 1-9. 1941.—Over-production of individuals in animal species may lead to a devastation of the food supply and may thus endanger the existence of the species. To prevent such dangers there are various instinct-regulated means of restriction of progeny. Examples are given from mammals, birds and insects. Mass-migrations with their mass deaths may be one such means.—G. Östergren.

21437. Addy, C. E. (512 Munsey Bldg., Baltimore 2, Md.) Eelgrass planting guide. *Maryland Conservationist* 24(1): 16-17. 1947.—Brief account of eelgrass decline and partial recovery, value of the plant as food for waterfowl, and otherwise ecologically and commercially. Recommendations for propagation by seed and for transplanting.—*Courtesy Wildlife Rev.*

21438. Bellrose, Frank C. Jr. Analysis of methods used in determining game kill. *Jour. Wildlife Management* 11(2): 105-119. 1 fig. 1947.—Reasonably accurate kill figures are necessary to sound game management. A variety of methods that have been used in this field are reviewed. Illinois experience with hunting club reports, calculations based on acreage and upon band returns, and license and application reports is set forth. The principal methods are further discussed and evaluated and recommendations are made. Author's summary: "Almost every state has attempted to obtain state-wide data on game kill, and almost every state has done so by means of application reports, license reports, or

questionnaires. Since return of the report forms is incomplete, practically all states have compensated for non-reporting hunter by assuming that his kill is the same as that of the reporting hunter. Data presented in this paper reveal that this practice results in erroneously high figures because the proportion of successful hunters who report is greater than the proportion of unsuccessful ones. Furthermore, most hunters, especially those who have bagged many game animals, exaggerate their kill figures. There is also a tendency for hunters to report for their home counties game kills made in 'foreign' counties. A partial correcting factor for these errors might be obtained from local kill data, which, for example, could be collected through checking stations. Obtaining data from a sample of non-reporting hunters, as practiced in Indiana, provides a possible correcting factor for differences in the kill of reporting and non-reporting hunters but not for exaggerated reported kills. Because state-wide methods of obtaining kill data through application reports, license reports, or questionnaires are open to appreciable error, it may be more expedient for game management purposes to use checking stations, county-wide interview surveys, or special calendars—adapted for recording game kill data—to obtain pertinent game kill statistics."—*Courtesy Wildlife Rev.*

21439. Blair, Frank D. (*Minnesota Dept. Conserv., State Office Bldg., St. Paul, Minn.*) Public hunting grounds today and tomorrow. *Conserv. Volunteer* 10(57): 13-16. 1 fig. 1947.—Including Federal Wildlife Refuge and National Forest lands, a total of more than 10,000,000 acres of land and 2,000,000 acres of water are available for public shooting. The units are listed, their areas recorded, and their principal game spp. mentioned. On state-owned tracts, not more than 1% of each area may be established as a game refuge. Under management, wildlife production has steadily increased on these lands. Plans for the future are outlined.—*Courtesy Wildlife Rev.*

21440. Bradt, G. W. (*Michigan Dept. Conserv., Lansing* 13.) Opossum—invader from the south. *Michigan Conserv.* 16(3): 4. 1 fig. 1947.—"There are some records of the opossum in Michigan in the early 1800's, but they seem to have disappeared completely about 1860, and reappeared about the time of World War I. Since about 1927 they have become widely distributed in the southern part of the State." The opossum is a sort of living fossil but succeeds because it eats anything and produces lots of offspring. The author discusses reproduction, death-feigning, food habits, and economic value. "The 'possum population . . . always drops to a low point following a good old-fashioned Michigan winter."—*Courtesy Wildlife Rev.*

21441. Bradt, G. W. (*Michigan Dept. Conserv., Lansing* 13.) Mink—jack of all trades. *Michigan Conserv.* 16(4): 4. 1 fig. 1947.—General article on appearance, range, food habits, dens, life history, and economic importance.—*Courtesy Wildlife Rev.*

21442. Bureau of Marine Fisheries. (*California Div. Fish and Game, Ferry Bldg., San Francisco*.) California sea lion census for 1946. *California Fish and Game* 33(1): 19-22. 1 fig. 1947.—Two species of sea lions occur along the California coast: the Steller, *Eumelopias jubata*, from Alaska southward to the islands off Southern California; the California, *Zalophus californianus*, from central California southward into Mexican waters. Because of their depredations on fishing activities, the killing of such sea lions when actually interfering with fishing has been legalized. To check upon claims of increased numbers, 7 counts of the sea lion population have been made since 1927. The total sea lion population of northern and central California composed chiefly of Stellers has not materially changed in the past 20 yrs. The 5,168 animals counted in 1946 fall within the range of 4,000-6,000 counted in former years. In Southern California, where the Californias predominate, the numbers have increased from 1,500 to 7,338 in the past 20 yrs. In the course of the 1946 survey, in addition to the 12,506 sea lions, 550 harbor seals, *Phoca richardsoni geronimensis*, and 21 elephant seals, *Mirovanga angustirostris*, were observed. The counts of harbor seals are incomplete.—J. F. Janssen, Jr.

21443. Cahalane, Victor H. (*Serv., National Park, Wash.*) Wildlife management in the national park system. *Yosemite Nature Notes* 26(5): 66-70. 1947.—The perpetuation of certain spp. is directly dependent on the protection afforded by the national parks. The rate of extinction of



wildlife forms is accelerating and in almost every extinction, civilized man has been at fault. In wilderness areas to which wildlife is adapted, spp. can be preserved by protecting them and refraining from meddling with their lives. Sometimes, where conditions have been disturbed, help must be extended if certain spp. are to survive. Reintroductions, if tried at all, should be of the same form but should not be undertaken unless careful study reveals the environment is again wholly capable of supporting them. In some instances, overpopulations occur; then the National Park Service prefers that the problem be solved by natural controls or by action outside of park boundaries. If a herd does not move beyond those limits, it may become necessary to reduce its numbers within the park. This should not be permitted to develop into a system of hunting within parks, which would radically change the concept of park management. It would then be for a minority—the hunters—instead of for the general public. • Despite long interference, aquatic life also should be brought back to an approximation of its original composition. This will require many years. Well-trained biologists, and more of them than now available, are needed for adequate management of wildlife in the national parks.—*Courtesy Wildlife Rev.*

21444. Campbell, Lou. (1106 State Office Bldg., Columbus 15, Ohio.) Ohio's bobwhite protected in 1912. *Ohio Conserv. Bull.* 11(4): 20. 1947.—The bobwhite was transferred to the songbird list in 1912 and, despite efforts by sportsmen, has been kept there. A new attempt inspires this comment, in part to the effect that the quail might well be hunted in parts of the State where conditions are favorable for the birds. In clean-farmed areas, especially where pheasants are present, bobwhites have decreased, so in the Ohio "pheasant belt" an open season on bobwhite is out of the question. "Many sportsmen are under the impression that sufficient number of birds can be raised in captivity to provide shooting. Practically every mid-West state has experimented along these lines, and all are in accord that stocked birds cannot provide shooting. For reseeded, yes; for shooting, no. The expense of raising birds and their low rate of survival after release rules this out. This is especially true in territory lying near the northern edge of the bob-white's wintering range in which northern Ohio falls."—*Courtesy Wildlife Rev.*

21445. Chapman, Floyd B. (Ohio Div. Conservation, Columbus.) The pine trees in wildlife conservation. *Ohio Conserv. Bull.* 11(3): 14-15. 3 fig. 1947.—Discusses utilization of pines by wildlife. Solid plantations are wildlife deserts for many yrs. Staggered planting in long and narrow, rather than square, blocks is recommended. Values of pines other than for wildlife are indicated and spp. suitable for growth in the State are suggested.—*Courtesy Wildlife Rev.*

21446. Chapman, Floyd B. (Ohio Div. Conservation, Columbus.) The apples in wildlife conservation. *Ohio Conserv. Bull.* 11(5): 14-15. 2 fig. 1947.—"The apples are one of the most valuable of all plant groups for wildlife." Illustrative comment follows and damage to orchards by deer, rabbits, and mice is noted. Seedling apple trees are abundant and can be protected or released to the advantage of wildlife. Other management suggestions are made. The crab-apple group also is considered.—*Courtesy Wildlife Rev.*

21447. Hensley, Arthur L., and Howard Twining. (California Div. Fish and Game, San Francisco.) Some early summer observations of muskrats in a northeastern California marsh. *California Fish and Game* 32(4): 171-181. 5 fig. 1946.—118 muskrats were captured and marked; 110 were young, mostly captured by hand, and 8 were live-trapped adults. Muskrat houses usually had 2-5 entrances under water and contained from 1 to 4 nests. Forty six houses had a total of at least 83 nests. It was estimated that 85% of the muskrat houses on the swamp were located during the study. Of 60 houses kept under close observation, 35 were occupied by 40 muskrat litters containing 187 young, or an average litter of 4.67. In 2 instances 2 different litters, presumably from the same parent ♀♀, were found with 32 and 33 days between births. Muskrat houses were used by waterfowl

and shorebirds as nesting sites and mink were found occupying muskrat houses as well as preying on the young.—A. L. Hensley.

21448. Hjersman, Henry A. (California Div. Fish and Game, San Francisco.) A history of the establishment of the ring-necked pheasant in California. *California Fish and Game* 33(1): 3-11. 2 fig. 1947.—Private liberation of pheasants began in the late 1870's or in the early 1880's. The first state liberation was made in 1889. Birds were secured from private sources until the inception of the first state game farm in 1908. This farm liberated a total of 4,183 pheasants until the project was abandoned in 1918. 5,000 pheasants were contracted for and released between that time and the establishment of the present state game farm system in 1925. In the first 20 yrs. of operation at least 309,428 pheasants were liberated. The 6 counties leading in hunting success are Butte, Glenn, Sacramento, Yolo, Colusa and Sutter. In a 4-yr. period, the total estimated pheasant kill for these counties was 185,700; for the same period, 11,151 were liberated.—H. A. Hjersman.

21449. Moore, Thos. A survey of buffalo and elk herds to determine the extent of *Brucella* infection. *Canadian Jour. Comp. Med.* 11(5): 131. 1947.—During the slaughter of buffalo and elk at 2 National Parks, blood was collected and serum was submitted for examination by the tube test with the regular *Brucella* antigen. 186 elk samples from animals of both sexes and all ages were negative. 37 buffalo samples, the majority from mature ♂♂, were examined: 6 were positive, 5 questionable and 26 negative. Five of the 6 positive samples were from ♂♂.—*Ronald Gwaikin.*

21450. Nestler, R. B., R. Stow, and W. R. Kauffmann. Vitamin A requirements in game birds. *California Fish and Game* 33(1): 13-18. 1947.—This is a reprint of "Game birds need more vitamin A" from *Feedstuffs* of July 20, 1946. Survival of breeders, production and hatch of eggs, and survival of offspring to 10 weeks of age increased in direct proportion with increase of vitamin A in the diet from zero to 8,000 I. U. per lb. of feed. In growing chicks, both survival and growth increased in direct proportion with the increase of vitamin A in diet until they reached a maximum of 3,000 I. U. Complete lack of vitamin A in growing stock caused death. Optimum production during following spring and summer occurred among quail that received 2500 I. U. or more of vitamin A in winter diet. Improper storage reduces amount of vitamin A in commercial feeds.—C. M. Herman.

21451. Stevens, Mary Lou. (512 Munsey Bldg., Baltimore 2, Md.) Farm wildlife conservation in Maryland. *Maryland Conservationist* 24(1): 26-27, 29. 1947.—A general essay commenting on early abundance of wildlife, classifying farm representatives of it, pointing out the importance of good habitat, discussing values, limiting factors, and management.—*Courtesy Wildlife Rev.*

21452. Vesall, David, Robert Gensch, and Ray Nyman. Beaver—timber problem in Minnesota's 'Big Bog.' *Conserv. Volunteer* 10(57): 45-50. 3 fig. 1947.—The area described was futilely drained for agriculture in 1915. About 2 decades later, control dams were installed in the ditches to reduce the fire hazard and improve the habitat for waterfowl and other wildlife. Beavers increased and spread and have been trapped annually since 1939 except in 1940 and 1944. The population has remained at about one active colony to each 1.3 miles of ditch. Greater rainfall has been the main factor in increasing damage to timber by flooding. Location and structure of beaver dams are set forth; 77% of the dams were in use at the time of the study. There were about 3 dams to a colony. Damage to timber was observed on about 29 acres for each mile of ditch; roads used for logging, patrol, and fire-fighting were inundated or undermined. Timber killed by the beavers would have had a market value of \$4,051 per mile of ditch. The annual timber production is worth nearly three times that of beaver pelts. Intangible values of the animals are noted and their consideration in management plans suggested.—*Courtesy Wildlife Rev.*





# BIOLOGICAL ABSTRACTS

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## GENERAL BIOLOGY

A. H. GRAVES, *Editor*

(See also Entries 24014, 24239, 25042, 25630, 25643, 25644)

### PHILOSOPHY OF BIOLOGY

23933. Boyden, Alan. (*Rutgers U., New Brunswick, N. J.*) Homology and analogy. A critical review of the meanings and implications of these concepts in biology. *Amer. Midland Nat.* 37(3): 648-669. 1947.—The original and necessary concept in homology is essential structural similarity. The secondary meaning for homology of common phylogenetic origin has no place in serial homology and a role of secondary importance in special homology. Since Darwin, biologists have tended to become a cult of ancestor worshippers to the extent that they even define homology as any similarity "due to ancestry" ignoring the fact that all inferences regarding ancestry must be based on the amounts and kinds of essential similarities revealed in their studies. The result of this misplaced emphasis is to divert the attention of biologists from their main task, which is to develop the most objective criteria possible for the classification of organisms based on knowledge of their essential natures. The current inflationary tendency to extend homology to cover physiological resemblances which are "due to common ancestry" is unfortunate. Homology has implied essential structural similarity for a century and a half. In the absence of fossils, phylogenetic interpretation is impossible to verify, and there are no fossil functions. Obviously intrinsic functional mechanism cannot be the ultimate test of homology in most cases. The mechanisms of serial and special homology are significantly different in their mode of operation and the 2 kinds of homology have a vastly different biological significance. A clear understanding in regard to the meanings, mechanisms and limitations of our knowledge about homology is necessary for further progress in systematic biology.—Alan Boyden.

23934. Gerard, Ralph W. (*U. Chicago.*) The scope of science. *Sci. Month.* 64(6): 496-512. 1947.—An elaborate argument, that whereas all science is the creation of man and a work of art, dealing with a series of levels of existence, the units of any particular level being external to those of lower levels and internal to those at higher ones, and exhibiting value and purpose in the sense of function, there is no reason why science should not be applicable at the high levels of mind, society, history, and human values.—H. F. Copeland.

23935. Simpson, George Gaylord. (*Columbia U., N. Y. C.*) The problem of plan and purpose in nature. *Sci. Month.* 64(6): 481-495. 1947.—The fact of adaptation was established by scholars some of whom, as Bell in the *Bridge-water Treatises*, did not believe in evolution. Lamarck's idea of evolution was essentially in modern terms orthogenetic, with adaptation to the environment, by use and disuse, as a collateral complicating influence. Darwin in effect established the fact of evolution, and presented natural selection largely as an explanation of adaptation. Paleontologists have insisted upon evolution not guided by the environment, and speculative biologists have named the guiding principle entelechy, "élan vital," etc. Finally, geneticists have described purely random change. Recently the reconciliation of these views has been foreshadowed by the work of Dobzhansky, Mayr, Julian Huxley, Stebbins, Muller, Sewall Wright, Haldane, R. A. Fisher, and many others. This work led to the foundation of the Society for the Study of Evolu-

tion, 1946. The reconciliation is to the effect that natural selection, eliminating unfavorable mutations, allows the accumulation of prospectively advantageous ones to the point where marked changes appear and selection along an apparently orthogenetic line becomes active.—H. F. Copeland.

### TAXONOMY AND NOMENCLATURE

23936. Metcalf, Z. P. (*North Carolina State Coll., Raleigh.*) Systematic zoology and the other branches of zoology. *Jour. Tennessee Acad. Sci.* 22(3): 232-239. 1947.—A plea for the recognition of nomenclature as a branch of systematic zoology subject to the continuous changes characteristic of all other sciences. There could therefore be no stability in nomenclature and no such thing as authority with power to set aside facts.—Z. P. Metcalf.

### MISCELLANEOUS

23937. Baitsell, George A. (Editor.) Science in progress. 5th series. xv+353p. 65 fig. Yale U. Press: New Haven, Conn., 1947. Pr. \$5.—As in previous volumes of this series, the chapters, here 10 in number, constitute reviews of recent advances in the series of important fields. The chapters are the following: I. The interior of the earth, by James B. Macelwane; II. Development of betatron and applications of high-energy radiations, by Donald W. Kerst; III. Contact catalysis between two World Wars, by Hugh S. Taylor; IV. Fundamentals of oxidation and respiration, by L. Michaelis; V. Complement: immunity intensifier, diagnostic drudge, chemical curiosity, by Michael Heidelberger; VI. Genes and the chemistry of the organism, by G. W. Beadle; VII. Concerning the cancer problem, by Peyton Rous; VIII. Plant diseases are shifty enemies, by E. C. Stakman; IX. Living cells in action, by Carl Caskey Speidel; and X. Recent advances in our knowledge of the anterior pituitary hormones, by Herbert M. Evans. An Introduction, by Frank B. Jewett, discusses The future of scientific research in the postwar world.

23938. Bradfield, R. The shortage of professional workers in agriculture and in forestry. 20p. 4 fig. National Research Council, 2101 Constitution Ave., Washington 25, D. C. 1947.—This report is based on information received through a questionnaire sent to the deans of 48 State Agric. Colleges and 8 forestry schools. All but 2 replied, indicating recognition of the importance of the shortage. Statements from 18 of the deans are appended. There is an estimated demand for 5,080 men trained to Ph.D. level in agriculture and forestry for 1946-1955. This would call for the training of 500 men per yr. The present deficit is about 1,410 men. Moreover, there has been a tremendous drop in the no. of men receiving B.A. degrees in this field. In 1940 there were 5,816 men who received B.A. degrees but in 1945 only 427 and in 1946 (estimate) only 416. Over 900 men working for Ph.D. degrees were interrupted by war service and about half expect to return and complete their work. An effort will be made to increase government aid and to provide pre- and postdoctoral fellowships to attract promising talent into professional work in agriculture and forestry.

23939. De Coninck, L. (*U. Ghent, Belgium.*) [Natural

sciences in Belgium during the war: Zoology, not including Physiology, Histology and Embryology.] *Natuurwetenschap. Tijdschr.* 27: 5-45. 1945.—A review. (An English translation is distributed by the Belgian-American Educational Foundation, New York; The British Council, London; and the Belgian-Soviet Center of Cultural Relations, Brussels.)—*L. Vandendriessche.*

23940. Deuse, P. [Natural sciences in Belgium during the war: Nature preservation.] *Natuurwetenschap. Tijdschr.* 27: 194-199. 1945.—A review. (An English translation is distributed by the Belgian-American Educational Foundation, New York; the British Council, London; and the Belgian-Soviet Center of Cultural Relations, Brussels.)—*L. Vandendriessche.*

23941. Fleming, Arthur S. Scientists and the Civil Serv-

ice. *Sci. Month.* 64(6): 515-520. 1947.—The federal service offers conditions of employment comparable with industries and universities. Needing its share of the best scientists, it is working on improvements. During the war, examination was decentralized and the agencies were given an increased part in the selection of their personnel; these policies are to be continued and standardized.—*H. F. Copeland.*

23942. \*Anonymus. [Natural sciences in Belgium during the war: Botany.] *Natuurwetenschap. Tijdschr.* 27: 188-193. 1945.—A complete bibliographical list with an introduction. (An English translation is distributed by the Belgian-American Educational Foundation, New York; the British Council, London; and the Belgian-Soviet Center of Cultural Relations, Brussels.)—*L. Vandendriessche.*

## BIOGRAPHY, HISTORY, AND BIBLIOGRAPHY

Editors: CARROLL W. DODGE, EILEEN R. CUNNINGHAM, T. C. RUCH, JUDITH W. HUNT

(See also Entries 25042, 26462)

### BIBLIOGRAPHY

23943. *Annales Universitatis Mariae Curie-Skłodowska*. Volume 1, 1946-1947. The Annales, published by the Universitas Maria Curie-Skłodowska, Biuro Wydawnictw, Plac Litewski 5, Lublin, Poland, will be comprised of papers on natural science, and related scientific branches, resulting from investigations of workers at the University and will be divided into the following sections: Section A—Mathematics, Physics, and Chemistry; Section B—Geography, Geology, Mineralogy, and Petrography; Section C—Biology; Section D—Medicine; Section E—Agriculture; and Section F—Philosophy and Humanities. Volume 1, Section C, will be made up of the following articles, each published separately: Aparat jądrowy Urostyła grandis Ehrbg. I. Aparat jądra malego, by Henryk Raabe; Opis drobnoustrojów stwierdzonych droga analizy bakteriologicznej w przewodzie pokarmowym, pluskwy domowej, muchy domowej i karaczana wschodniego, by Nina Nicewicz, Włodzimierz Nicewicz, and Romuald Kowalik; Równonogi (Isopoda) Województwa Poznańskiego, by Jarosław Urbański; Recherches sur les ciliés Thigmotriches (Thigmotricha Ch. et Lw.). I. Sur un genre nouveau de la famille Conchophthiridae Kahl, by Zdzisław Raabe; Mechanizm ewolucji w odniesieniu do filogenezy człowieka, by Jan Mydlarski; Aparat jądrowy Urostyła grandis Ehrbg. II. Aparat jądra dużego, by Henryk Raabe; Truncatellina claustralis (Gredl) 1856 (Moll. Pulm. Vertiginidae) na Podolu, by Jarosław Urbański; Uzebnienie Naczelnych, by Wanda Steflicka; and Lichenum generis Usnea studium monographicum. Pars generalis, by Józef Motyka. A Supplement, O celach i metodach badań geobotanicznych, by Józef Motyka, will also appear.

23944. *Arquivos de Biologia e Tecnologia*. Volume 1, 1946. Director: Marcos Augusto Enrietti. Annually. 214 pages (13 articles) in the first volume. Published by the Instituto de Biologia e Pesquisas Tecnológicas, Caixa Postal, 357, Curitiba, Paraná, Brasil.—The following papers comprise this issue: Sobre a dosagem fotométrica do cobre em águas, by Reinaldo Spitzner; Fauna parasitológica paranaense. I. Haemoproteus columbae Celli and Sanfelice, 1891 em Columba livia domestica nos pombais de Curitiba, by Milton Giovannoni; Fauna parasitológica paranaense. II. Otoacariase psorótica dos caprinos, by Milton Giovannoni e Gastão V. L. Kubiak; Fauna parasitológica paranaense. III. Raillietina (Skrjabinia) bonini (Mégnin, 1889) em pombos domésticos, by Milton Giovannoni; Método simples para a determinação do quociente proteico no liquor, by Arthur O. Schwab; Estudos sobre leishmaniose. I. Primeiros casos de leishmaniose espontânea observados em cobaios, by Heitor Medina; Contribuição ao estudo da planície litorânea do Estado do Paraná, by João José Bigarella; Análises de alguns calcários paranaenses, by Alseido Leprevost; Estudo contributivo ao conhecimento de algumas águas minerais do Estado do Paraná, by Reinhard Maack e Reinaldo Spitzner; Sobre a padronização de um método prático para a dosagem da cafeína (em erva-mate), by Milton E. Bühner; Sobre a coloração vital de Bartonella muris Mayer, 1921, by Milton Giovannoni; Sobre as "ratadas" do primeiro planalto par-

anaense, by Milton Giovannoni, Lycio G. C. Vellozo, e Gastão V. L. Kubiak; and Contribuição ao conhecimento dos solos dos Campos Gerais no Estado do Paraná, by Carlos Bodziak, Jr., e Reinhard Maack.

23945. Fisher, Harvey I. (*U. Hawaii, Honolulu 10*). *Utinomi's Bibliographica Micronesica: Chordate Sections*. *Pacific Sci.* 1(3): 129-150. 1947.—During the later years of the Japanese occupation of Micronesia Dr. Huzio Utinomi attempted to collect all the literature pertaining to the natural sciences of these islands. This bibliography of 208 pages and containing > 4,000 titles in several languages, including Japanese, was published in 1944 by the Hokuryukan Publishing Co. (Tokyo). The present redaction, in addition to giving a translation of the original preface, lists all titles given in the chordate sections, including the protochordates and all vertebrate classes. Titles in Japanese have been translated into English, but all titles (approx. 500) are listed because of the great interest in the area and because of the unavailability of the original. Other sections of the bibliography are now being translated by students in the various fields represented.—*H. I. Fisher.*

23946. *Haumania. Revista del Centro de Estudios Agronomicos de Cuyo*. Volume 1, Number 1, January 1947. Editorial Committee: Guillermo Covas, Enrique Schiel, and Mario M. Barraza. 46 pages (6 articles) in the first issue. Published by El Centro de Estudios Agronomicos de Cuyo, Pedro Molina 63, Mendoza, Argentina.—The following papers comprise this issue: La fermentación del estiércol como fuente de calor para la esterilización parcial de tierra para almácigos, by Enrique Schiel; Dos Zigoñiláceas nuevas para la Flora cuyana, by Adrián Ruíz Leal; Período de incubación de la "Tuberculosis" del olivo en Mendoza, by Enrique Vitoria; Nuevo procedimiento para la determinación del enranciamiento en aceite de oliva, by León Nijensohn, and Arrigo Bonino; Estudios cariológicos en Antófitas, by Benno Schnack, and Guillermo Covas; and Nota sobre infección brucelósica en ovinos, by José Luis Minoprio.

23947. *Heredity. An International Journal of Genetics*. Volume 1, Number 1, July 1947. Editors: Cyril D. Darlington, and Ronald A. Fisher. Assistants: G. W. Beadle, T. Caspersson, Th. Dobzhansky, B. Ephrussi, and Ø. Winge. Issued three times per year. 141 pages (8 articles) in the first issue. Published by Oliver and Boyd, Tweeddale Court, High Street, Edinburgh, Scotland. Subscription price \$8.50.—The following papers comprise this issue: A directional change in the genetic constitution of a natural population of *Drosophila pseudoobscura*, by Th. Dobzhansky; Colour inheritance and sex determination in *Lebistes*, by Ø. Winge, and E. Ditlevsen; Competition and dominance of incompatibility alleles in diploid pollen, by D. Lewis; The theory of plant breeding for yield, by O. H. Frankel; An alteration in gene frequency in *Ricinus communis* L. due to climatic conditions, by S. C. Harland; Methods of analyzing the virulence of bacteria and viruses for genetical purposes, by L. L. Cavalli, and G. Magni; Linkage of Rex with shaker-2 in the house-mouse, by D. S. Falconer; and Undulated: A new genetic



factor in *Mus musculus* affecting the spine and tail, by M. E. Wright.

23948. *Memoirs of the Faculty of Agriculture, National Taiwan University.* Volume 1, Number 1, December 1946.

Published by the National Taiwan University, Taipei, China.  
—The following article comprises the first issue: Tobacco diseases in Formosa, by Takashi Matsumoto.

## CYTOLOGY

Editors: R. E. CLELAND, *Plant*; BERWIND P. KAUFMANN, *Animal*

(See also B. A. 21(9): 21279, 21288, 21306, 21462, 22023, 22449, 22552, 23126, 23635, 23761; and in this issue 23980, 23981, 23983, 23994, 24003, 24026, 24027, 24168, 24576, 24620, 24631, 24937, 25028, 25093, 25094, 25095, 25097, 25110, 25111, 25117, 25119, 25123, 25124, 25126, 25163, 25164, 25167, 25168, 25169, 25279, 25280, 25635, 25740, 25741, 25923)

### GENERAL.

23949. Buchholz, J. T. (*U. Illinois, Urbana.*) Chromosome structure under the electron microscope. *Science* 105 (2737): 607-610. 5 fig. 1947.—The electron microscope gives, theoretically, 100 times better resolution than microscopes dependent upon light. Some of the conditions necessary for the examination of objects with an electron microscope are, however, very discouraging to biologists. The objects must be subjected to extreme desiccation. The difficulty of obtaining small, thin objects is overcome by teasing parts from cells. It was found possible to recognize parts of chromosomes in prophase after they were desiccated on a slide. Parts of chromosomes were separated completely from the surrounding cytoplasm. The isolated parts could be dried, mounted on a film, and transferred to the object holder of an electron microscope. The picture of chromosome structure obtained has not greatly changed the general concept derived from light microscopy. There was found a thread that connects the granules or chromosomes or to which a great variety of chromomeres are attached. The attached chromomeres or granules had a wide range of shapes, sizes, and "density". Some were spherical and relatively translucent to electrons while others were opaque. Synapsis was observed in some chromonemal threads where they appeared paired. Nothing new concerning synapsis was found. The gene of genetic interpretations may represent sections of chromonemal threads, including several kinds of granules. It seems that a concept of gene elements may emerge from a continued study of chromosomal structure by this method.—H. M. Kaplan.

23950. Hayes, E. Russell. (*Ohio State U., Columbus.*) The plasmat reaction. *Anat. Rec.* 97(3): 391. 1947.—An abstract.

23951. Klingstedt, Holger. Is the synaptic period of meiosis a modified mitosis? *Soc. Sci. Fennica Commentationes Biol.* 7(12): 1-9. 2 fig. 1939(1941).—First meiotic prophase stages are considered in appraisal of the hypothesis that synapsis is a modified and highly specialized mitosis. In drawing a comparison between the 2 processes, the author lists a series of similarities and differences. Polarization, which characterizes meiotic prophase, is attributed to the close approximation of the centrosomes, and the influence of their field of activity, although visible fibers are not found. Thus, a correspondence is visualized between leptotene of meiosis and metaphase of mitosis, between amphitene and anaphase, synzinesis and telophase, and between pachytene and interphase.—H. Gay.

### PLANT

23952. Aleksandrov, V. G. [The biology of the cell nucleus of plants, and the physiological nature of the callus tissue in cuttings.] *Sovetskaya Botanika [Leningrad]* 1943 (6): 17-25. 1943.—The survival of the plant cell after the elimination of the nucleus is not rare and has been observed in tissues where nutrients are stored, e.g., in the cortex and callus tissues of *Rhododendron ponticum* and in the seed endosperm of *Agropyron cristatum*. The process of elimination of the nucleus, as observed in the callus tissue of cuttings from *R. ponticum*, consisted in the nucleus being engulfed by crystals of Ca oxalate. The cells containing the crystals were observed always to be in the immediate vicinity of the root initials, and it is thought that the nutrition of these initials by the substances in the surrounding callus tissue is facilitated by the elimination of the nuclei. There is, in fact, a certain resemblance between cortical and callus tissue on the one hand and the endosperm on the other; both store nutrients and both

supply with these nutrients the requirement of growing roots, shoots and embryos.—*Courtesy Hort. Absts.*

23953. Böcher, Tyge W. (*U. Copenhagen.*) Cytological studies of *Arabis holboellii* Hornem. *Hereditas* 33(4): 573. 1947.—*A. holboellii* is a very polymorphous species. According to Rollins, 2 of its vars. have the chromosome numbers  $n = 7, 14$  and  $21$ . The typical *A. holboellii* was studied by the author, who found  $2n = 21 +$  a very small extra chromosome. The chromosome number and behavior during meiosis support the idea that this plant is apomictic.—T. W. Böcher.

23954. Brown, Meta S. (*Agric. Expt. Sta., College Station, Texas.*) A case of spontaneous reduction of chromosome number in somatic tissue of cotton. *Amer. Jour. Bot.* 34(7): 384-388. 6 fig. 1947.—As a result of pollinating *Gossypium hirsutum* ( $n=26$ ) with pollen of *Hibiscus esculentus* ( $n=36$  or  $65$ ), an abnormal cotton plant containing approx. 100 chromosomes was obtained. Flower parts were reduced and the plant was sterile, but there was no evidence that okra chromosomes had taken part in its development. The absence of typical polyploid characteristics and the low incidence of quadrivalents indicate that the plant was not a balanced polyploid. After several seasons, a grafted portion of the plant developed several normal appearing branches, with  $2n-1$  chromosomes. The modified branches retained the abnormal flower characteristics to a lesser degree and remained sterile.—*Auth. abst.*

23955. Camara, A. Cromosomas dos trigos hexaploides. [Chromosomes of hexaploid wheats.] *Agronomia Lusitana* 6(3): 221-251. 6 pl. 1944.—Measurements were carried out on mitotic chromosomes of *Triticum vulgare*, *T. compactum* and *T. spelta* and idiograms constructed for the hexaploid wheats. All these wheats possess 3 SAT chromosomes, 2 of which have a secondary constriction and the third bearing a satellite. The length of the nucleogenic zone of the former type is about  $1.1 \mu$  to  $0.8 \mu$ . *T. vulgare*, *T. compactum* and *T. spelta* exhibit very little karyotypic differences among themselves and the idiograms give little information regarding the evolution of the hexaploid wheats. As much, or more karyotypic variability may be found within certain strains or vars. from the same species as among the above-mentioned species. An attempt was made to locate in the idiograms the chromosomes of the 3 "genomes" A, B and C.—A. Camara.

23956. Ernould, L. L'autopolyploidie expérimentale chez la Betterave. [Exptl. autopolyploidy in the sugar beet.] *Cellule* 50(3): 361-430. 8 fig. 1946.—From sugar beets (*Beta vulgaris*), mixoploids (mixture of tissues  $2x$  and  $4x$ ) were obtained in 1942 by immersion of whorls in solns. of colchicine at 0.2%, 0.4%, or 0.8%. In 1943, the 2d yr. of vegetation, their inflorescences were plunged into a soln. of colchicine at 0.5 or 1%. Among other things, cross fertilization was obtained, after having eliminated as far as possible the diploid parts ( $2x=18$ ), observed or which reappeared after treatment. The elimination was based on the difference of dimensions of the pollen grains, the diploid pollen being from  $1\frac{1}{3}$  to  $1\frac{1}{4}$  times larger in diam. than in normal haploid pollen. Seeds were harvested. The counting of the chromosomes in the root tips of the plants produced from the seeds showed the occurrence of triploids ( $3x = 36$ ) and tetraploids ( $4x=36$ ). The tetraploids produced seed in 1945 and again gave tetraploids, the study of which was begun. Their agronomic qualities are very similar to those of normal diploid sugar beets. Their leaves are larger, with short petioles, and show a mucro situated deep within the two rounded extremities of the limb. By treatment of the shoots, triploids and tetraploids of *B. patellaris* were also obtained. The tetraploids were very viable, with thicker

stalks and leaves, and reproduced by seed.—*L. Ernould (transl.)*.

23957. •Hollande, A.-Ch. Étude de la caryocinèse et de la cytotidérèse des cellules de la racine de jacinthe. [Study of caryokinesis and cell division in the root cells of hyacinths.] *Cellule* 50(3): 311-360. 5 pl., 20 fig. 1946.—The author describes capillary tubercles in the protoplasm (solenosomes) and in the nucleus (spiremoids), corpuscular centers connected by granules (stigmosomes, nucleosomes) in persistent association (prochromonema), situated in helicoid formation at the surface of the tubules. The chromosomes are derived from the spiremoid, which persists in the interphase. The chromonema is not the chromatid; it is formed by a semi-fluid substance produced on the level of the nucleosome centers, extending along the internucleosome tracts. The genes are nucleosome centers; they ought not to be considered the basis of hereditary characters. At telophase there is an abutment of the chromosomes in order to re-form spiremoids. The polar cap is formed by filaments of the spindle formed by solenosomes. The phragmoplast is elaborated by solenosomes and without connection with the spindle. At the time of the cellular elongation, there is a dissolution of the lateral membrane by the solenosomes. At the end of the mitosis, the solenosomes of the spindle autolyze themselves or are digested by other solenosomes, rolled in a spiral around them.—*A.-Ch. Hollande (transl.)*.

23958. Levan, Albert. (Cytogenetic Lab., Swedish Seed Assoc., Svalöf, Sweden.) Studies on the camphor reaction of yeast. *Hereditas* 33(4): 457-514. 6 fig. 1947.—Various chemical treatments alter the normal mode of growth and propagation of *Saccharomyces cerevisiae*. Colonies are formed, the cells of which often have abnormal shape extended, tube-like or inflated, piriform and bottle-like. This reaction, originally found by Bauch after treatment with camphor vapor, is shown in the present paper to be induced unspecifically by some 50 tested substances, aliphatic, alicyclic and aromatic, most of them being known for their narcotic activity. The camphor-reaction ("cf-reaction") involves a disturbance of growth control, the suppression of which may be more or less complete. A correlation is found between the threshold values of the cf-reaction and the water solubility of the active substances. The reaction is usually induced by concs. not close to the point of saturation of the solns. According to Ferguson, this is characteristic of an unspecific thermodynamic activity, physical in nature. Certain substances, however, such as the lower aliphatic alcohols, acetone and chloral hydrate, exert in addition specific, chemical action. The nuclear divisions of untreated and of narcotized yeast were studied. Mitotic disturbances occur: a considerable increase in chromosome number of the nuclei, multipolar spindles, vagabonding chromosomes, etc. Certain types of disturbance make it possible to observe single chromosomes, which furnished a key to the normal chromosome number of the yeast studied. It was estimated as a minimum of 10, possibly higher. The influence of various factors on the cf-reaction was studied, such as the physiological condition of the yeast employed, the effect of temp., etc. A certain unspecific resistance to the reaction may be induced. Cells which have been gradually accustomed to an increasing content of ethanol (as is the case of yeast taken from the sediment immediately after fermentation has been completed) are found to be more resistant, not only to aliphatic alcohols but also to KCN, than are cells which have grown on wort without any considerable content of ethanol. Cold, alone or combined with chemical treatments, imparts to the cells increased tendency to give the cf-reaction. The evident connection of the cf-reaction with the spontaneous involution growth characteristic of old yeast cultures and with other cellular reactions, as, for instance, c-mitosis, c-tumor, and certain toxic reactions, is pointed out. It is claimed that the cf-reaction is a member of the important complex of narcotic reactions.—*Albert Levan*.

23959. Lima-de-Faria, A. (Inst. Genetics, Lund, Sweden.) Disturbances in microspore cytology of *Anthoxanthum*. *Hereditas* 33: 539-551. 27 fig. 1947.—In the pollen grains of *A. aristatum*, lack of orientation and non-differentiation of the nuclei have been found in 7 plants with 1 to 4 B chromosomes. A complete serialation between the division of the generative nucleus, unaccompanied by that of the vegetative nucleus (the normal case), and a division of the vegetative nucleus, unaccompanied by that of the generative (passing

through the complete synchronization of the division of the 2 nuclei), has been observed in one plant with 1 B chromosome. Chromosome contraction and spindle disturbances were also found, and a positive correlation between chromatin drops and delay in division was recognized (their origin is attributed to chromosomes of the normal complement). The relation between these phenomena is discussed; the conclusion is drawn that they are probably different expressions of disturbances in timing relations.—*A. Lima-de-Faria*.

23960. Lindegren, Carl C. (Washington U., St. Louis.) Function of volutin (metaphosphate) in mitosis. *Nature [London]* 159(4028): 63-64. 1947.—Yeast cells stained with acidulated toluidine blue in formalin showed volutin-rich chromosomes in the vacuole. After non-dividing cells receive adequate nutrient, all cells show such chromosomes; on a poor medium volutin may disappear from most cells. (*Torulopsis utilis* rarely loses all its volutin). Data suggest that only chromosomes coated with metaphosphate are capable of division. When spores form, volutin appears in the epiplasm.—*R. Walker*.

23961. Nybom, Nils. (U. Lund, Sweden.) Accessory chromosomes in *Allium*. *Hereditas* 33(4): 571-572. 1 fig. 1947.—The occurrence of 0-6 accessory chromosomes of various size in the pollen grains of some *A. porrum* plants is briefly mentioned. These chromosomes undergo a normal disjunctional division at the pollen mitosis.—*N. Nybom*.

23962. Reed, Roland A. (Loyola U., Los Angeles, Calif.) Nuclear phenomena in the tapetum of *Magnolia grandiflora*. *Wasmann Collector* 7(1): 1-15. 2 pl. 1947.—The tapetal cells of *M. grandiflora* undergo 3 divisions during meiosis. The divisions begin during early zygotene and are completed by early diakinesis. All observed divisions are mitotic. In the 1st division normal mitosis may occur without the formation of a cell plate resulting in a binucleate tetraploid cell. Incomplete mitosis caused by the fusion of telophase groups or chromosomal bridges may result in a uninucleate tetraploid cell. Second divisions are more irregular. Chromosomes of a binucleate cell may congress on a single equatorial plate and normal separation produces a cell with 2 tetraploid nuclei. Binucleate cells may undergo normal mitosis without cell plate formation producing a cell with 4 diploid nuclei. Chromosomes at converging spindle poles may be incorporated into 1 nucleus giving rise to a cell with 1 median tetraploid nucleus and 2 terminal diploid nuclei. Union of chromosome groups may result in a uninucleate octoploid cell. 3 general types of cells result from the 3d divisions: a binucleate cell with round or ovoid nuclei; a binucleate cell with bean-shaped nuclei; and a cell with 1 large nucleus as a result of the union of chromosome complements. Increase of nutritive materials within the tapetal cells appears to be the cause of irregular orientation of spindle structures and hyperchromaticity of chromatin material. Mitotic irregularities and degenerative fusions account for amitotic appearances in aged tapetal cells.—*Auth. summ.*

23963. Rezende-Pinto, M. C. de. (U. Porto, Portugal.) A new cytological technic, tannin-iron, for nucleoli and plastids. *Stain Technol.* 22(1): 3-4. 1947.—A useful technic in plant cytology. Its specificity for nucleoli and plastids arises from the previous hydrolysis in *N HCl*.—*E. R. Noble*.

23964. Rosen, Gösta von. (Beet Breeding Inst., Swedish Sugar Co., Hällesjö, Landskrona, Sweden.) The rapid nigrosine method for chromosome counts, applicable to all growing tissues of the plant. *Hereditas* 33: 567-570. 1947.—A method applicable to serial work for estimation of the number of chromosomes in polyploid material is described. The treatment is essentially the same for roots as for leaves and flower-buds. All treatments are made in cooled fluids and no heating is used for staining. The pigment is alcohol-soluble nigrosine.—*G. von Rosen*.

23965. Schreiber, G. (Inst. Butantân, São Paulo, Brazil.) Estudo cariométrico dos poliploides de coffeea. [Caryometric researches on *Coffea* polyploids.] *Bragantia* 6(7): 279-298. 2 pl., 5 fig. 1946.—Discussion of the problem and preliminary results are presented. There is a perfect correlation between chromosome number and nuclear volume for all the members of the polyploid series of *C. arabica*. *C. congesta*, although with 22 chromosomes, has a nuclear volume exactly corresponding to that of *C. arabica* with 33 chromosomes.—*Americo Grossmann*.



23966. Winge, Ö. (Carlsberg Lab., Copenhagen, Denmark.) The segregation in the ascus of *Saccharomyces Ludwigi*. *Antonie van Leeuwenhoek Jour. Microbiol. and Serol. Jubilee Vol. Albert P. Kluyver* 12(1/4): 129-132. 1947.—*N* designates a gene for normal spore germination, *L* one for long growth of cells. *N* and *L* are located in different chromosome pairs. During the 1st division of meiosis *L* is continually separated from *l*, and *N* from *n* (pre-reduction), as both pairs of genes are situated so near the centromere that no crossing-over between it and the genes takes place. At the 2-nucleate stage the spindles arrange themselves parallel with the longitudinal axis of the axis, so that both nuclei give off a daughter nucleus to each end of the ascus. This arrangement has been observed directly.—*M. P. Löhnis*.

## ANIMAL

23967. Ancona, Umberto d'. (U. Padova.) Verifica del poliploidismo nelle cellule epatiche dei Mammiferi nelle cariocinesi provocate sperimentalmente. [A verification of polyploidy in the hepatic cells of mammals in experimentally induced mitoses.] *Arch. Ital. Anat. e Embriol.* 47: 253-286. 2 pl., 18 fig. 1942.—Mitoses were induced in the hepatic cells of albino mice by removal of a large portion of hepatic tissue, followed in some expts. by colchicine injns. The sizes of the equatorial plates form a unimodal frequency polygon, rather asymmetrical on the left. The no. of chromosomes is highly variable, very often much higher than the normal diploid no. (> 100). Tetraploid mitoses are very frequent, diploid ones less frequent, and octoploid ones rare. Different sizes of the resting nuclei are attributable to their diploid, tetraploid or octoploid condition, as is shown when they have been induced to divide exptly.; this polyploid condition is supposedly derived by endomitosis. When the no. of chromosomes is very large, they appear to be irregularly distributed or to form multipolar mitoses; this is presumably conditioned by the fact that the spindle appears to be of the same size in all mitoses, independent of the chromosome number. No proportionality is noted between the size of the mitoses and the chromosome size. It is suggested that the polyploid condition occurs frequently in the stable tissues of the vertebrates, as it does in many organs of the insects.—*M. A. Barbasetti*.

23968. Corti, Alfredo. (U. Torino.) Il lacunoma. [The lacunome.] *Arch. Ital. Anat. e Embriol.* 47: 135-252. 20 fig. 1942.—The term "lacunome" was applied by the author to a particular system of lacunae in the animal cytoplasm, first discovered by him. These are characterized by their form, endoplasmic position, number and constitution, appearing formed of a well-defined hyaline substance, and not enclosed by a membrane or by any cytoplasmic structure. In an appraisal of various observations and interpretations, the author concludes that: 1) the substance contained in the lacunae of the lacunome is a highly dispersed hydrosol, no trace of it having been found in the preps.; the opinion that the lacunome is of lipid nature is rejected, as not based on exptl. data; 2) the lacunome is a constant and well delimited formation, the concept of an amorphous Golgi zone or spot being considered as the result of insufficient researches; 3) no relation exists between the lacunome and the chondriome; 4) the Golgi apparatus is not a real structure and it is formed by chemical and physical factors at the limit between the vacuome and the remaining cytoplasm; 5) no relation is found between the idiosome and the vacuome; and it is confirmed that the trophospongion concept is wrong, being based upon altered material. The lacunome was found in various cells including intestinal cells of vertebrates in fasting conditions, and those of full term fetuses, in which the intestine had not yet begun to function.—*M. A. Barbasetti*.

23969. Fiori, Sergio. (U. Torino.) Le variazioni del glicogeno e delle grandezze nucleari nella cellula epatica di Mammifero (*Mus musculus*). [Variations of glycogen and of nuclear size in the mammalian hepatic cells.] *Arch. Ital. Anat. e Embriol.* 47: 554-563. 2 fig. 1942.—Nuclear sizes were detd. in material previously used for the determination of the glycogen cycle (by Foraggiana). Normally fed mice which show a maximum glycogen content during the night (11-12 p.m.) and a minimum in the morning, have a cycle of nuclear variations generally parallel to the glycogen cycle, showing a maximum toward midnight and a minimum during the day. There is no evidence of a causal relation between

these 2 cycles, as the nuclear size may be influenced by other factors depending upon the functional activity of the liver.—*M. A. Barbasetti*.

23970. Fankhauser, G. (Princeton U., N. J.), and R. R. Humphrey. (U. Buffalo.) Development and chromosome number of the offspring of a tetraploid axolotl female mated with a diploid male. *Anat. Rec.* 97(3): 386. 1947.—An abstract.

23971. Jones, Oliver P. (U. Buffalo, N. Y.) The Golgi element in primitive erythroblasts of the 11-day rat embryo. *Anat. Rec.* 97(3): 393. 1947.—An abstract.

23972. King, James C. (Columbia U., N. Y. C.) A comparative analysis of the chromosomes of the guarani group of *Drosophila*. *Evolution* [New York] 1: 48-62. 38 fig. 1947.—The mitotic chromosomes of 6 spp. of neotropical *Drosophila*, *guarani*, *guarú*, *subbadia*, *guaramunú*, *griseolineata* and *guarajá*, species nova, were examined. *D. guarajá* was found to have 5 pairs of chromosomes; all the others have 6. The salivary-gland chromosomes of the pure spp. and both the mitotic and salivary-gland chromosomes of *guarú*-*subbadia* hybrids and *guarú*-*subbadia*-*guarani* hybrids give convincing evidence that differences in the mitotic chromosomes are the result of differences in the amt. and position of heterochromatin. Inversions in the salivary-gland chromosomes of *guarú* and in the salivaries of the *guarú*-*subbadia* hybrids show very close relationships in gene arrangements. The salivaries of the *guarú*-*subbadia*-*guarani* hybrids show surprisingly good pairing and few inversions. The conclusion that *guarú*, *subbadia* and *guarani* at one time formed a single interbreeding population is inescapable. The probable course of chromosomal evolution within the group is discussed.—*J. C. King*.

23973. Marchesi, Cesare. (U. Torino.) Contributo alla conoscenza del condrioma. Ricerche su la cellula epatica di *Cavia cobaya*. [A contribution on the chondriome. Researches on the hepatic cells of *C. cobaya*.] *Arch. Ital. Anat. e Embriol.* 47: 634-648. 2 fig. 1942.—Cytologic study of hepatic cells during digestion and fasting shows that the chondriome in guinea pigs is abundantly and uniformly distributed; the chondriosomes are filamentous or granular, generally both these forms being present. When the animals were examined soon after a meal (1.3-7 hrs. thereafter) the chondriosomes were prevalently filamentous, whereas 14, 18 or 25 hrs. after the meal they were nearly all granular. This is just the opposite of what was found in other Mammalia; a discussion follows on the interpretation of this fact.—*M. A. Barbasetti*.

23974. Moree, Ray. (State Coll. Washington, Pullman.) A confirmation of Rafalko's Feulgen method. *Stain Technol.* 22(2): 63-65. 1947.—A method nearly identical with that used by Rafalko on small amoebae, oocyte prophase of *Haemaphysalis* and several yeasts has been found confirmatory to his results when applied to mammalian testicular tissue. The method is descr., additional preparational notes are given, and several questions raised on possible improvement of the technic.—*Auth. abst.*

23975. Scaccini, Andrea. (U. Bologna.) Studio citologico della spermatogenesi nella gallina di Faraone domestica (*Numida meleagris* L.). [Cytologic study of spermatogenesis in the domestic guinea fowl.] *Arch. Ital. Anat. e Embriol.* 47: 803-824. 2 pl., 17 fig. 1942.—In the spermatogonial divisions of the guinea fowl 16 large chromosomes and 48-56 small ones can be counted (a total of 64-72). The form of the 8 pairs of large chromosomes is descr., and it is noted that this sp. shows marked differences from other groups of fowls as to chromosome form: it has 4 pairs of metacentric chromosomes (2 V-shaped and 2 U-shaped) whereas the domestic fowl has only 3, and the pheasants and turkeys have only 2; in addition, one pair has a J form which has never been observed in the others. The equatorial plates of the primary spermatocytes allow a more precise count of the chromosomes, which number 70-72. In the primary spermatocytes the central body appears as a short curved rod; at the end of the division, the 2 daughter central bodies appear as an enlarged V, probably an early preparation for the next division, which occurs shortly thereafter. On the basis of the frequency of the various phases of spermatogenesis, it is calculated that the spermatogonial mitosis is not so slow as the reduction division, that the primary spermatocyte has but a short rest period, and divides very quickly.—*M. A. Barbasetti*.



23976. Shackelford, Richard M., and Louise Wipf. (U. Wisconsin, Madison.) Chromosomes of the mink. *Proc. Natl. Acad. Sci. U. S. A.* 33(2): 44-46. 6 fig. 1947.—Seminiferous tubules from the testes of 6 ranch-bred mink (*Mustela vison*) revealed a diploid chromosome number of 28. 13 pairs can be matched as if they are homologous and the 2 chromosomes of the 14th pair are notably different though both have a satellite and other features in common. This pair may represent the sex chromosomes.—G. W. Lasker.

23977. Teissier, Georges. (Ecol. Haut. Étud., Paris.) Sur le rapport nucléoplasmatique des cellules de mammifères. [The nucleo-plasmatic ratio of mammalian cells.] *Compt. Rend. Soc. Biol.* 135: 662-666. 1941.

23978. Wallgren, Ivar. The pale granular substance of the cell and the structure of the living mass. I. The cytoplasm. II. The nucleus of the cell. III. Golgi apparatus. *Acta Path. et Microbiol. Scand.* 23: 415-456. 1946. [See also *B. A.* 21(4): Entry 7985.]—I. The fine structure of the cytoplasm was examined, partly in living blood corpuscles, partly in stained cells and in films of blood and bone marrow, and partly in different kinds of tissue cells in paraffin sections. A new kind of nonstaining granules, the "pale granules," is descr. They were observed in abundance in all cells studied. They are intimately intermixed with the previously known

chromophile granules and may be connected with them by threadlike bridges in the cytoplasm. The cytoplasm is compared with an emulsion in which 2 kinds of drops are suspended in a structureless hyaloplasm. II. A large part of the cell nucleus contains a basal mass which, like the cytoplasm, is constructed of a 3-phase system, an emulsion, in which 2 kinds of drops are suspended in a structureless basal substance. The chromophile drops are evenly distributed and are surrounded by pale drops. The basal structure is contractile and shifts occur in it and on its surface. The nucleus is more firm than the cytoplasm, and chromosomes, nucleoli, and chromatin lumps are situated in the surface layer of the basal mass partly immersed in it. III. As in the cytoplasm and the nucleus, a double granular system of chromophile and of pale drops suspended in a structureless basal substance exists in the Golgi apparatus. When the secretion drops first become visible, they are closely adjacent to the chromophile granules in the system. Later the growing secretion drops are surrounded by chromophile drops and by pale granules. The pale substance seems to be composed of carbohydrate matter. It is suggested that the pale substance is of vital importance as regards the function of the cell.—John T. Myers (courtesy Chem. Absts.).

## GENETICS

Editors: ORLAND E. WHITE, *Plant*; SEWALL WRIGHT, *Animal*; H. H. STRANDSKOV, *Human*

(See also Entries 23956, 23958, 23966, 23970, 23972, 24008, 24904, 24905, 24924, 24925, 24933, 24936, 24946, 25021, 25022, 25055, 25180, 25190, 25202, 25254, 25268, 25282, 25284, 25287, 25293, 25295, 25355, 25558, 25623, 25690, 25744, 25751, 25773, 25779, 25784, 25820, 25847, 25908, 25911, 25915, 25916, 25923, 25925, 25931, 26016, 26048, 26057, 26059, 26061, 26065, 26066, 26071, 26239, 26468)

### GENERAL

23979. Baker, H. G. (U. Leeds, Eng.) "Criteria of hybridity." *Nature* [London] 159(4042): 546. 1947.—The author qualifies a previous note (*Nature* 159: 221. 1947); other artificial crosses than those quoted have been made. But author still insists on the necessity for such crosses in connection with the "index method".—R. Walker.

### PLANT

23980. Bannan, M. W. (U. Toronto, Canada.) Tetraploid *Taraxacum kok-saghyz*. III. Achene weight, flowering, and plant development. *Canadian Jour. Res. Sect. C. Bot. Sci.* 25(2): 59-72. 2 fig. 1947.—The ultimate size of diploid or tetraploid kok-saghyz plants, when grown in pots or at wide spacings in the field, was not detd. primarily by the wt. of the achenes from which they originated. Conversely, large or small tetraploids, when crossed among themselves, did not produce achenes reflecting the differences in plant size. Tetraploids differed from diploids in possessing larger organs, but increase in size was more or less counteracted by reduction in numbers. This was especially true as regards flowering. Tetraploids were notably deficient in the production of inflorescences during the 1st yr., and since they were correspondingly freed from the inhibiting effects of flower and seed development on root enlargement, the root size of the vegetating tetraploids tended to surpass that of the more floriferous diploids, unless the latter was subduced. On the whole, 1st-yr. plants with the broadest and leafiest rosettes and few or no capitula developed the biggest roots. An association of such characteristics is probably the best criterion for the selection of large-rooted plants. When large root size is desired it would seem advisable to avoid pregermination treatments that hasten maturation and stimulate flowering.—Auth. abst.

23981. Beal, J. M. (U. Chicago.) Some results of cross-pollination on *Lilium regale*. *Bot. Gaz.* 108(4): 526-530. 14 fig. 1947.—Cross-pollinations have been made on *L. regale* with pollen from > 12 spp. of lilies during the last decade. Viable seeds have developed in some capsules following all cross-pollinations. The seedlings resulting from these seeds reach flowering size during the 3d and 4th seasons following planting, but several thousand of the supposed  $F_1$  hybrids have shown no evidences whatever of the pollen parents; they closely resemble the seed parent in all visible characters. These seedlings show no greater variability than that shown by those resulting from self-pollination. Meiotic behavior

is indistinguishable in the supposed  $F_1$  hybrids from that in *L. regale*. Following cross-pollinations, pollen tubes entered the ovules through the micropyles, and both embryos and endosperm developed at essentially the same rate and in the same manner as in selfed *L. regale*. No explanation has so far been found for this unusual behavior.—J. M. Beal.

23982. Brewbaker, H. E., R. R. Wood, and H. L. Bush. (Great Western Sugar Co., Longmont, Colo.) Single-germ seed. *Proc. Amer. Soc. Sugar Beet Technol.* 1946: 259-262. 1942.—Two sources of single-germness discovered in breeding stocks are reported. In the 2d generation one of these segregated 2 singles, 190 doubles and 194 multiples. "Single-germ" plants are normal in appearance and show some doubles (up to 34%) and triples (up to 1%). "Double-germ" plants appear as intermediates in the segregation for singles and multiples.—Authors.

23983. Burton, Glenn W. (Coastal Plain Expt. Sta., Tifton, Ga.) Breeding Bermuda grass for the southeastern United States. *Jour. Amer. Soc. Agron.* 39(7): 551-569. 4 fig. 1947.—The evidence available indicates that Bermuda grass, *Cynodon dactylon*, is a highly cross-pollinated tetraploid having 36 somatic chromosomes and several fragments. Since Bermuda grass can be economically propagated by vegetative planting, a breeding program designed to produce superior clones was used. Making controlled Bermuda grass hybrids is extremely tedious and time-consuming. Consequently, the breeding program was begun with 5,000 seedlings from open-pollinated seed obtained from common, Tift, and 2 S. African Bermudas that were interplanted in a crossing block. Following one year's observations, 147 of the best of these clones, representing a range in types, were planted in 4 × 24 foot plots in triplicate. Over 50 observations were recorded for each from 1939 to 1946. Characteristics studied included rate of spread, sod density, frost resistance, disease resistance, yield, percentage weeds, percentage cover, seed yield and seed set, the interaction when grown with crimson clover and with Kobe lespedeza, root-knot-nematode resistance, and longevity. Striking differences in all measurements were observed. Other expts. were designed to compare the following features of a few superior clones: Fertilization requirements, chemical composition, palatability, and the yield and longevity when clipped to simulate close grazing. Coastal Bermuda, one of the best of these clones, equals or surpasses the parents in all characteristics, makes good quality grass hay, and has produced nearly twice as much beef as common Bermuda grass when grazed. Sta-

tion workers and farmers in the Southeast who have grown Coastal Bermuda report that it appears to be widely adapted and generally superior to common Bermuda. Coastal Bermuda grass sprigs are being certified by the Georgia Crop Improvement Association and a number of farmers are planting them.—G. W. Burton.

23984. Crescini, Francesco. II "Rafanobrassica" (*Raphanus sativus* × *Brassica oleracea*). *Italia Agric.* 79(5): 253-258. 9 fig. 1942.—The crossing work of G. D. Karpechenko is reviewed. In the early twenties, he obtained the species hybrid *Raphanobrassica* (*Raphanus sativus* × *Brassica oleracea*). Cultivation expts., carried out by the author first in Bologna and later in Turin, showed that *Raphanobrassica*, sown in Aug. or Sept. at the same time with 2 other oil-yielding *Brassica* spp., *B. napus oleifera* and *B. campestris oleifera*, develops in the 1st year only a rosette of leaves, flowering and fruiting taking place in the 2d year. As is the case with the other Brassicas, yields depend very much on meteorological factors, particularly during the flowering period. Notwithstanding that in good years an abundant number of fruits are produced on the giant hybrids, seed production is usually poor and the oil content of the seeds is lower than the average of colza seeds. For all these reasons *Raphanobrassica*, compared with old oil-yielding spp. of *Brassica*, does not seem worth growing. Nor is *Raphanobrassica* to be considered as a valuable fodder plant, being, in the following respects, inferior to colza as a biennial: flowering late, having setaceous leaves, and exhibiting slight resistance to winter frosts.—W. Bally.

23985. Doxtator, C. W., and A. W. Skuderna. (American Crystal Sugar Co., Rocky Ford, Colo.) Crossing experiments in sugar beet lines. *Proc. Amer. Soc. Sugar Beet Technol.* 1946: 230-236. 1947.—Nine mother lines obtained from harvests of seed of individual beet plants of one var. were crossed in all possible combinations for tests. Five lines were used in 1942 and 6 lines in 1943. Field tests in 1942 and 1943 of the resulting 25 hybrids, compared with the present lines, gave significant evidence of hybrid vigor in half of the crosses. By the use of this technique it was possible to discard the lines which lacked ability to produce high yielding hybrids, thereby making possible a much greater improvement in the variety than was possible by ordinary mother line methods.—Authors.

23986. Flory, W. S. Jr. (U. Virginia, Boyce.) Crossing relationships among hybrid and specific plum varieties, and among the several *Prunus* species which are involved. *Amer. Jour. Bot.* 34(6): 330-335. 1947.—37 vars. were used in the self and attempted cross-combinations. 11 *Prunus* spp. were involved in the 176 variety and specific crosses tried, and a total of about 37,000 pollinations were made. The paper is directed at a study of the behavior of variety groups when considered collectively from the standpoint of similar botanical origin. Effective pollenizers, in general, for vars. derived from the following *Prunus* groups are as indicated: (1) *hortulana*—other *hortulana*, or *munsoniana* vars.; (2) *munsoniana*—*hortulana* or *salicina* vars.; (3) *salicina*—most other vars. which are not of hybrid origin, and a few of these; (4) Asiatic-American species hybrids—native *angustifolia*, *munsoniana* and often *salicina* vars.; also the Asiatic hybrid Wickson. Self-sterility is of quite general occurrence among diploid plums; the partially self-fertile var. Methley being one known exception. The data indicate that the ease of crossing encountered among the diverse plum vars. grown in the s.-w. U. S. is often closely correlated with the similarity of botanical derivations of these vars. Sufficient data are at hand to allow the selection, or to give strong indication, of effective pollenizers for almost all desirable commercial plum vars. grown in the s.-w. U. S.—W. S. Flory, Jr.

23987. Fries, Nils. (U. Uppsala, Sweden.) Experiments with different methods of isolating physiological mutations of filamentous fungi. *Nature [London]* 159(4032): 199. 1947.—Of some 600 mutants in *Ophiostoma multianthratum*, 463 were classified. Some were from irradiated ascospores, but most of them came from irradiated conidia. Irradiation of conidia impregnated with uranyl nitrate gave higher incidence of mutants but no obvious shift in proportions of the types. 245 were obtained by total isolation of 13,405 mycelia (1.83% of conidia surviving irradiation; 0.02 of conidia irradiated). 218 mutants were obtained by

"concentration" of mutants: slower germination of mutants allowed filter concentration from the larger normal mycelia. Both methods give similar proportions of mutants requiring bivalent sulfur, amino acid, or a nucleotide constituent. Most mutants needing inositol were obtained by total isolation; other differences were doubtful, due to small numbers.—R. Walker.

23988. Gardner, Eldon J. (U. Utah, Salt Lake City.) Studies on the inheritance of apomixis and sterility in the progeny of two hybrid plants in the genus *Parthenium*. *Genetics* 32(3): 262-276. 1947.—Data obtained from studies involving the progenies of 2 guayule (*P. argentatum*)—mariola (*P. incanum*) hybrids have been used in analyzing the inheritance of apomixis and sterility. The progeny of one hybrid were found to reproduce through sexual processes. The 2d hybrid proved to be partially apomictic. Two types of sterility were encountered. In one case incompatibility was observed in plants representing transitional stages between apomixis and amphimixis. The other type was apparently controlled by recessive factors which were accumulated and came to expression through selfing. Some of these factors probably influence the development of the pollen tube. The study has demonstrated the fact that sexual polyploids can occur in nature. The data suggest that the apomictic processes, failure of reduction, failure of fertilization and pseudogamous development are controlled independently. The major factors favoring sexual processes must be few, and appear to be dominant. Modifying factors are also postulated and may account to a large extent for the facultative nature of processes involved in reproduction in this group.—E. J. Gardner.

23989. Hayes, H. K. Yield genes, heterosis and combining ability. *Amer. Nat.* 80: 430-435. 1946.—Among the various genes affecting yield, either favorably or adversely, are those determining resistance to disease, the elaboration of chlorophyll and plant size. The author then considers the present theories proposed to cover heterosis, and deals with the significance of combining ability. A final section mentions the practical applications of these phenomena to the breeding of forage crops.—Courtesy Pl. Breeding Absts.

23990. Knight, R. L. The genetics of blackarm resistance. V. Dwarf-bunched and its relationship to *B<sub>1</sub>*. *Jour. Genetics* 48(1): 41-50. 1947.—Dwarf-bunched plants (called "Dwarf-bunched") appeared in the *F<sub>2</sub>* of a cross between 2 American Upland (*Gossypium hirsutum*) types, Uganda B31 and a Sudan var. 514. Results seem to indicate that "Dwarf-bunched" is due to 2 duplicate genes called *D<sub>a</sub>* and *D<sub>b</sub>*, one, *D<sub>a</sub>*, from 514 and the other from Uganda B31. The heterozygote *d<sub>a</sub> d<sub>a</sub> D<sub>b</sub> d<sub>b</sub>* shows variability from dwarf to normal. Some results are presented to show that *d<sub>b</sub>* occurs in Gambia Native (*G. hirsutum* var. *punctatum*) and in the American Upland Uganda SP84, XA129, and Delta Pine, though not present in some other Upland vars. Results indicate that *d<sub>a</sub>* is closely linked to, or possibly identical with, the *B<sub>1</sub>* gene for blackarm resistance.—G. N. Stroman.

23991. Mehliquist, Gustav A. L. (Missouri Bot. Gard., St. Louis), and T. A. Geissman. (U. California, Los Angeles.) Inheritance in the carnation (*Dianthus caryophyllus*). III. Inheritance of flower color. *Ann. Missouri Bot. Gard.* 34(1): 39-72. 2 pl. 1947.—6 independent genes for self-colors in the carnation have been identified. Their functions may be summarized as follows. *Y* controls the production of yellow anthoxanthin. It is hypostatic to *I*. In the presence of the recessive allele *y*, only a limited amt. of anthoxanthin is developed, resulting in pale yellow or cream-colored flowers. *I* controls the production of ivory-white anthoxanthin. It is epistatic to *Y*. The recessive allele *i* permits the production of yellow anthoxanthin. *A* is the basic gene for anthocyanin. It is fully effective only in combination with *Y* and *I*. In combination with *i* only a small amt. of anthocyanin is produced, resulting in a series of pale colors on yellow background (the transition series). In the presence of the recessive allele *a* no anthocyanin is produced. *S* controls the amt. of anthocyanin. In the presence of its recessive allele *s* much less anthocyanin is formed. One, possibly 2 as yet unidentified genes modify the effect of *S-s*. *R* determines the kind of anthocyanin. The dominant allele causes the production of cyanin resulting in crimson or dark red flowers, whereas its recessive allele *r* causes the production of pelargonin only, resulting in bright red or scarlet flowers. *M* determines the



number of sugar molecules attached to the anthocyanin molecule. With the dominant allele there are 2 sugar molecules attached, in the presence of the recessive allele *m* only 1. The number of sugar molecules attached to the anthocyanin has a marked effect on the anthocyanin. For instance, *M* with *r* changes the color from bright red or scarlet to deep pink and *M* with *R* changes crimson or dark red to magenta-purple. In general, it may be said that the addition of the 2d sugar molecule has a blueing effect on the anthocyanin color. It has no visible effect on the anthoxanthin. At least 5 genes are concerned with the different types of flower variegation in the carnation. 4 of these appear to be multiple alleles with genes for self-color. *y<sup>11</sup>* causes limited amts. of anthocyanin to be produced under favorable conditions. This anthocyanin occurs as a tinge or flush on white background. This type has been termed "flushed". *y<sup>ear</sup>* with *a* causes broad, indefinite, randomly distributed stripes of ivory anthoxanthin on yellow ground, and with *A* similar stripes of anthocyanin on colors of the transition series. This variegation has been termed "random broad". *a<sup>ear</sup>* causes narrow, definite, randomly distributed stripes on white or yellow background. This variegation has been termed "random narrow". *s<sup>ear</sup>* causes sporadic, irregular striping on any member of the *s* series (salmon, light pink, lavender). *Pic* causes a definite variegation pattern, "picotee", in the presence of *y<sup>ear</sup>* or *a<sup>ear</sup>*. The recessive allele *pic* probably has no visible effect. The data indicate that more multiple alleles of these genes concerned with flower variegation exist, or that their action is influenced by modifying genes. All of the genes for flower color appear to be concerned also with the general vigor of the plants. Recessives were, on the average, somewhat less vigorous than the corresponding dominants. Multiple recessives were definitely weaker than the multiple dominants. The gene *I* seems also to be directly involved in the development of the cuticular waxy material responsible for the "bloom" or glaucousness of the leaves and stems, as plants with *i* are quite deficient in this respect. The gene *M* or genes associated with it appears to be able partly to make up this deficiency caused by *i*.—G. A. L. Mehligist.

23992. Owen, F. V., Albert M. Murphy, and George K. Ryser. Inbred lines from curly-top resistant varieties of sugar beets. *Proc. Amer. Soc. Sugar Beet Technol.* 1946: 246-252. 2 fig. 1947.—A superior hybrid sugar beet was produced by crossing a ♂-sterile beet with a new curly-top resistant inbred line designated CT9. The hybrid was compared with mass-selected commercial vars. and an increase of 12% in yield of sugar per acre was obtained. The CT9 hybrid was highly resistant to the curly-top disease and was also resistant to a localized petiole and crown-rot disease. It also produced uniform beets, a feature much desired for mechanized harvest operations. Other inbred lines were observed to possess various other valuable characters. Some were observed to be extremely nonbolting. Others produced largely bilocular or 2-seeded seed balls, a character which may make artificial shearing or segmenting of seed unnecessary. The utilization of the highly self-fertile inbred lines appears to be dependent upon hybridization with ♂-sterile types of beets. These ♂-sterile beets can be produced in desired quantities because the basis of the inheritance is cytoplasmic or maternal and the offspring largely resemble the ♂-sterile ♀ parent.—Authors.

23993. Pirovano, Alberto. Ibridi di pruni con peschi. [Plum-peach hybrids.] *Italia Agric.* 78(10): 681-685. 3 fig. 1941.—In 1923 plum (*Prunus domestica*) flowers were pollinated (a) with pollen of peach trees (*P. persica*), (b) with peach pollen which had been exposed to a magnetic field of low frequency alternated currents, (c) with pollen which had been treated with u.-v. rays, (d) with pollen exposed to β and γ radium rays. From (a) 3 seeds were obtained, from (b) 3, from (c) 18, and from (d) 6. Seeds from pollination with treated pollen germinated sooner than those resulted from normal pollination. After 18 years of observation the following characteristics are noted: Normal hybrids have the aspect of peaches with pink flowers borne on a short peduncle; they are sterile in both sexes. All the hybrids, when grafted on yellow plums (*P. insubrica* f. *syriaca*), grow vigorously at first, but soon begin to fade away; when grafted on a peach they grow for a few yrs., but die even when planted on soils where normal peach trees grow for 12-15 yrs. Among the hybrids of the (b) group there was one which exhibited pro-

nounced intermediary characters between the 2 parents. The leaves have red spots and curl when fully developed. The only specimen of this type died during the severe winter of 1939. The other interesting type was encountered in group (d). It exhibits the maternal characters of the plum tree with white, fertile flowers. The fruits are small; before ripening deep fissures appear, which cause an entire desiccation of the pulp before the fruits are fully ripe. The stones resemble plum stones.—W. Bally.

23994. Rizet, Georges. (Fac. Sci., Caen, France.) Quelques caractères des mutations observées chez le *Podospora anserina*. [Some characters of mutations observed in *P. anserina*.] *Compt. Rend. Soc. Biol.* 135: 1080-1082. 1941.

23995. Stahmann, Mark A., and J. F. Stauffer. (U. Wisconsin, Madison.) Induction of mutants in *Penicillium notatum* by methyl-bis (β-chloroethyl)amine. *Science* 105 (2741): 35-36. 1947.—The action of the nitrogen mustard, methyl-bis (β-chloroethyl)amine in producing morphological mutants in the strain NRRL-832 of *P. notatum* was studied. The treatment consisted of suspending the spores in an aq. soln. of the drug. For comparison the number of mutants produced by exposing spores to u.-v. light was detd. The nitrogen mustard was relatively toxic to the spores and this lethal action continued throughout the treatment. The drug was very effective in producing morph. mutants and the percentage of mutants continued to increase throughout the duration of treatment. U.-v. radiation at 2,750 Å exerted a considerable toxic action and also induced mutations. However, the number of mutants reached a maximum and then declined. The max. number of mutants produced was somewhat higher than that obtained by the mustard treatment. There was no essential difference between the 2 treatments as to the type of mutants produced. On the basis of the number of spores surviving treatment, the nitrogen mustard was more effective than the u.-v. radiation in inducing mutants.—H. M. Kaplan.

23996. Stewart, Dewey, John O. Gaskill, and G. H. Coons. Heterosis in sugar beet single crosses. *Proc. Amer. Soc. Sugar Beet Technol.* 1946: 210-222. 1947.—35 sugar beet hybrids obtained by mating 11 inbred strains and 1 open-pollinated var. with U. S. 215, U. S. 216, and Synthetic Check as pollen parents were studied for root yield, sucrose percentage, and sugar production under conditions in which leaf spot was not a factor. The inbred strains were relatively high yielding. Other comparisons were made with Synthetic Check, a var. known to be very high in yield when leaf spot is not a factor. As a consequence, few hybrids significantly exceeded, in the attributes measured, the means of parents of Synthetic Check. As a class, however, the hybrids were significantly superior to the parents. The data were based on identified hybrids and were taken in absence of leaf spot. They are interpreted as indicating definitely that heterosis occurs in sugar beets, but that with the higher yielding inbreds, and when comparisons are based on a high yielding var. such as Synthetic Check, few inbreds give outstanding performances. Synthetic Check may be of value as a tester in the application of the top-cross technique to locate the inbreds with best potentialities.—Auth. summ.

23997. Sturtevant, A. H., and L. F. Randolph. Iris genetics. *Bull. Amer. Iris Soc.* 99: 52-66. 1945.—Some progress on the genetic behavior of garden iris has been made since the chromosome studies of Longley, Simonet and Randolph established the fact that older vars. of tall bearded iris are diploid with 24 chromosomes and the modern vars. are primarily tetraploids with 48 chromosomes. Dwarf bearded iris are largely in a special group and have 40 chromosomes. From the studies of available material and records on iris breeding it is clear that the genetics of tetraploid iris is much more complex than in the case of diploids where the Mendelian principles can be effectively applied. Tetraploid inheritance involves the possibility of 9 types of segregating crosses and is further complicated by the fact that from the same cross different ratios may be obtained from genes which give identical ratios in diploids. A character analysis of tetraploid iris has revealed the following: white is dominant in the tetraploids rather than recessive as it is in the diploids; yellow and plicata genes of the tetraploids are evidently the same as those of diploids and were probably derived from the same diploid ancestors; it is much more difficult to combine two recessives



in tetraploid stocks than in diploid stocks; the study of linkage in tetraploids is more complicated than linkage in diploids. The authors conclude that there is need for additional data from segregating populations of adequate size to determine the mode of inheritance of specific characters. Iris breeders would benefit from such genetic expts. with properly controlled crosses of sizable populations.—E. C. Vols.

23998. White, Orland E., and Wray M. Bowden. (U. Virginia, Boyce.) Oriental and American Bittersweet hybrids. *Jour. Heredity* 38(4): 125-127. 1 fig. 1947.—Reciprocal crosses were made between the American Bittersweet, *Celastrus scandens*, and the Oriental Bittersweet, *C. orbiculatus*. These 2 spp. differ in a number of striking characters, involving height, sex, inflorescence, and fruit. *C. orbiculatus* has perfect flowers and is self-fertile; *C. scandens* has a number of sex types ranging from staminate to pistillate, with intersexes. The fruit capsule valves on *C. orbiculatus* are deciduous; on *C. scandens* they are persistent. Both spp. have the same chromosome number,  $n = 23$ . *C. orbiculatus*  $\times$  *C. scandens* produced no seeds that germinated. *C. scandens*  $\times$  *C. orbiculatus* produced 12 fruits, with only 2 seeds that germinated. One  $F_1$  plant survived, which grew slowly the first 2 yrs., making only 6 in. growth the 1st yr. When it flowered, the flowers were pistillate. Backcrossed with both of its parents, it produced smaller fruits than either grandparent, usually containing only one seed. The fruits of the parent spp. averaged 3-4 seeds per fruit. 65 fruits obtained from these backcrosses, when planted under the most favorable conditions, produced only 2 plants, representing one for each backcross. These also made a very slow growth.—O. E. White.

#### ANIMAL (EXCEPT MAN)

23999. Briquet, Raul Jr., and Jay L. Lush. (Iowa State Coll., Ames.) Heritability of amount of spotting in Holstein-Friesian cattle. *Jour. Heredity* 38(4): 99-105. 3 fig. 1947.—Heritability of amt. of white spotting estimated visually was studied in a Holstein-Friesian herd. Repeatability of estimates from one age to another averaged 0.982. The subjective method of estimating was, therefore, reasonably accurate for the purpose. No sex difference was found. The % white decreased a tiny bit after 1 yr. but no more than would be expected from changes in body proportion with age. Heritability of individual differences is high. Intra-sire regression of offspring on dam yielded 99% as an estimate of heritability, with 5% fiducial limits of 82 to over 100%. Regression of offspring on mid-parent yielded an estimate of 93% with 5% fiducial limits of 88 to 98%. The distribution of individual % was nearly rectangular. Probably > 3 pairs of genes with major effects are involved and there is some distortion of scale near zero and near 100%. The number of major genes can hardly be as large as 8 or 10, else the standard deviation would not be so large a fraction of the range.—J. L. Lush.

24000. Danforth, C. H. (Stanford U. Sch. Med., Calif.) Heredity of polydactyly in the cat. *Jour. Heredity* 38(4): 107-112. 3 fig. 1947.—Polydactyly in the cat appears to be inherited as a simple dominant trait which is not sex-linked, nor lethal when homozygous. The penetrance is good, but grades of expression extend over a wide range involving both number and size of parts. The evidence is believed to indicate that the primary effect of the gene is to increase quantitatively the amt. of potentially digit-forming tissue in the limb buds, hence the seemingly discontinuous qualitative differences in the adult reflect merely small quantitative variations in the embryo. No evidence is found that the digits individually have any genetic background of their own.—C. H. Danforth.

24001. Dobzhansky, Theodosius, and Sewall Wright. (U. Chicago.) Genetics of natural populations. XV. Rate of diffusion of a mutant gene through a population of *Drosophila pseudoobscura*. *Genetics* 32(3): 303-324. 1947.—3840 orange-eyed flies were liberated at a point near Mather, California, on June 16, 1945. On the 6 following days, orange and wild flies were caught and recorded along a line 1200 meters through this point. At about 71°F the variance of the distribution of orange flies increased at about 0.007 km.<sup>2</sup>/day in one direction ( $\sigma = 0.21$  km. after 6 days), much as in previous expts. on Mt. San Jacinto. 25,134 orange-eyed flies were released at the same point from July 23-Aug.

11, 1945. Between Aug. 10 and Aug. 16 the standard deviation is estimated to lie between 0.24 and 0.4 km. Two weeks later, the estimate is between 0.29 and 0.51 km. Flies were again collected 10 months later (June, 1946). No orange homozygotes were found, but some flies proved to be heterozygous with a concentration near the point of release. The standard deviation is estimated between 0.43 and 0.72 km. The population density of wild *D. pseudoobscura* in midsummer at Mather is found to be around 0.4 per 100 m.<sup>2</sup>; only 5-10% of the density in the corresponding season on Mt. San Jacinto.—Sewall Wright.

24002. Epsteins, F. F. (U. Ghent, Belgium.) Over determinatie van vleugelgrootte bij *Drosophila*. [Determination of the size of the wings in *Drosophila*.] *Natuurwetenschap. Tijdschr.* 22: 209-212. 1940.—When the tip of the wings of *Drosophila* nymphs was removed mechanically within the first 32 hrs., there was a marked decrease of the size of the wings; elimination of the wing tip at a later time has no influence. The decrease in size is due to a shrinking that takes place between the 30th and the 40th hr. The author believes that a factor which prevents the shrinking in the critical period is localized in the tip of the wing. In the mutant form "miniature", there is no shrinking, but 40 hrs. after pupation, the wing growth starts to go much slower than in normal forms. This is due to the non-formation of "papillary cells" on the wing surface.—L. Vandendriessche.

24003. Fábíán, G., and G. Matoltsy. Test of a cancerogenic substance in respect to the "non-disjunction" frequency of the X-chromosome in *Drosophila*. *Nature [London]* 158: 911-912. 1946.—Benzpyrene, while not affecting the frequency of non-disjunction in *Drosophila*, appears to lower the normal mutation rate.—Courtesy Pl. Breeding Absts.

24004. Hetzer, H. O. (U.S.D.A. Res. Center, Beltsville, Md.) Inheritance of coat color in swine. *Jour. Heredity* 38(4): 121-124. 1 fig. 1947.—Yorkshire  $\times$  Duroc-Jersey crosses reported in this paper gave results in close agreement with the assumption that the Yorkshire has the same major color genes as the Landrace. Like the white of the Landrace, the white of the Yorkshire depends on one major gene (*I*) epistatic to both black and red color. This gene is dominant to its allele (*i*) carried by the Duroc-Jersey. There is also a gene for black spotting in the Yorkshire. This gene (*Ep*) is hypostatic to (*I*) but is completely or almost completely dominant to non-black (*e*). There was no indication of linkage between *Ep* and *I*. In addition the Yorkshire apparently has 2 or 3 genes diluting red to sandy or white. It is suggested that these genes are imperfectly dominant over their normal alleles for intense red.—Auth. summ.

24005. Juhn, Mary. (Agric. Expt. Sta., College Park, Md.) The effects of thiouracil on feather pigment determination in hybrid fowl. *Jour. Heredity* 38(4): 113-116. 1 fig. 1947.—The body feathers of  $F_1$  ♂♂ from Barred Rock  $\times$  Brown Leghorn ♀ matings are fully barred black and white in the juvenile plumage, the shape is rounded, and the vane solid with barbulation extending toward the barb apices. As adults, feathers of the dorsal tracts become longer and narrower, the shape of the vane being acuminate with a solid core and lacy fringe. Simultaneously with the development of these structural changes, feathers arise which usually are barred at the apex but possess orange, yellow, or black basal segments. When such birds are placed upon a dry feed diet containing 0.5% thiouracil by wt., the structural aspects of the saddle tracts are accentuated, the feathers become longer, narrower, and more lacy, and barring is laid down again in feathers having colored basal segments. At the same time, feathers of the body in the breast and thigh, normally fully barred and having a solid vane, become elongated with progressively decreasing barbulation of the margins of the vane. Such feathers come to resemble the normal saddle feathers and as in that region, among the predominantly barred feathers, some arise that are barred at the tip with orange, yellow, or black in the basal segments. In the thigh, some such induced exceptional feathers were found to also lay down barring at the base, as in the thiouracil-modified exceptional feathers of the saddle. Thiouracil treatment is effective in demonstrating the presence of the genetic factors for color in those feather regions where normally color is not manifest. The expts. also suggest a relation between the causes of the

development of lacininess and those determining the expression of color.—*Auth. summ.*

24006. Keeler, Clyde E. (*Georgia State Coll. for Women, Milledgeville.*) Modification of brain and endocrine glands, as an explanation of altered behavior trends, in coat-character mutant strains of the Norway rat. *Jour. Tennessee Acad. Sci.* 22(3): 202-209. 2 fig. 1947.—The genes producing certain coat-characters in Norway rats also modify significantly the brain and gland structures of their bodies, and these structural modifications result in modified physiology, which, in turn, produces modified behavior. Certain effects of individual coat-character genes are evident in the morphology, physiology, and behavior of genetically simple strains bearing one modified gene. Some of these effects appear in synthesized strains built up genetically so as to contain homozygous combinations of two and also of three such coat-character genes. The behavior effects resulting from brain and gland modifications produced by the genes for black and hooded, and to a lesser extent albino, played a leading role in the original domestication of the laboratory albino rat, although it has probably been selected unwittingly ever since for other unlabeled tameness genes.—*C. E. Keeler.*

24007. Lerner, I. Michael (*U. California, Berkeley*), and L. N. Hazel. (*Kimber Farm, Niles, Calif.*) Population genetics of a poultry flock under artificial selection. *Genetics* 32(3): 325-339. 1947.—The rôles of selection, chance and migration were analyzed with respect to the improvement in egg production in the Univ. of California poultry flock over a period of 12 yrs. The important features of the mating system used were: annual flock size from 400-700 pullets, semi-closed system of breeding, emphasis on family and progeny performance, selection and breeding from ♀♀ 2 yrs. of age or older, and deliberate avoidance of close mating. The analysis indicated that the theoretical gains expected on the basis of known selection intensity, heritability and average interval between generations were in close agreement with the actual gains realized (5.28 vs. 5.6 eggs per yr.). This is interpreted as a verification of the principles of population genetics derived deductively by earlier workers. Progeny-testing was found to have made a significant contribution to the improvement obtained in spite of the increase in the average age of parents incident to its use. The rate of approach to homozygosis was found to be of the order of 2% per generation, or 1% per yr., in spite of the mating system used. This situation arose as a result of family selection which leads to a reduction from 11-17 actual sires per generation to a calculated number of 6 effective sires. No significant detrimental effects of this rate of inbreeding on egg production could be established. The rôle played by chance in changing gene frequencies was found to be rather large, the standard error of chance segregation being between 7.5% for genes with a frequency of 50% and 1.5% for genes with frequencies near 1%. Migration was not an important factor quantitatively in this population, since the number of introduced sires was relatively low. It was shown that artificial selection provides potent means for rapid incorporation or elimination of introduced genes. As a general conclusion, it may be stated that the currently accepted principles of population genetics (excluding the rôle of mutation) are empirically verifiable and lead to predictable rates of improvement in populations subjected to artificial selection.—*Auth. summ.*

24008. Mário Da Rosa, Francisco. (*Escola Superior de Med. Vet., Lisbon, Portugal.*) Um nova mutação, luxação congénita da anca, no coelho. *Rev. Med. Vet. [Lisbon]* 40(13): 103-125. 1945.—Among humans, certain families have been known in which congenital luxation of the hip occurred with remarkable frequency. An hereditary basis was suspected but could not be proved. Such a condition has now been discovered in chinchilla rabbits. Beginning at 2 to 3 months of age one femur (rarely both) begins to rotate slowly outward so that eventually the head of the femur leaves the acetabulum and lies behind it. The rotation draws the tarsus far out to the side, the whole leg usually being markedly abducted. The condition, which consists anatomically in a shallow acetabulum and a small, poorly developed head and neck of the femur, is essentially bilateral even though actual displacement occurs only in one limb. In exptl. matings of heterozygote parents the deformity was reduced in 17 out of 85 offspring, and it was shown to be due

to a simple recessive autosomic gene, sometimes able to behave as a partial dominant.—*H. A. Smith.*

24009. Sawin, Paul B., and Dorothy S. Gadbois. (*Brown U., Providence, R. I.*) Genetic influences upon the sex ratio in the rabbit. *Genetics* 32(3): 286-302. 1947.—Observations of the sex distribution in a population of 17,058 rabbits obtained from 7 pure races, from F<sub>1</sub> hybrid generations obtained by crossing them and from several F<sub>2</sub> and backcross generations, afford a unique opportunity to study the genetic influences responsible for departures from the normally expected equality of ♂♂ and ♀♀ in a laboratory mammal. At least 3 major influences affecting the sex ratio are found in these animals. The most obvious is that arising from hybridization, which in 6 out of 8 crosses increases the proportion of ♂♂ beyond that found in either parental race. Of secondary importance are racial differences. In one race the irregularity is so marked as to indicate the action of a major autosomal gene having a greater suppressive influence on the ♂. A 3d influence is that exerted by the hybrid mother, evidence for which is found in 3 types of mating. In all of these cases, genetic action by way of the threshold of viability of sperm or of the developing embryo is indicated and the possible relationships of these observations to several theories as to alteration of the sex ratio are discussed. It is suggested that the reported successes or failures of attempts to alter the sex ratio may not necessarily have been due to alterations in acidity or alkalinity of the ♀ tract but to some other physiological change.—*P. B. Sawin.*

24010. Tirelli, Mario. (*U. Rome, Italy.*) Egg and eye color in mutant silk worms. *Jour. Heredity* 37(12): 377-383. 7 fig. 1946.—Normally the silk worm has black eyes and grey eggs. The author observed a series of mutant races having red or yellow pigment in eyes and eggs. The biochemical basis of these differences is discussed and these are related to the genetic behavior of these races when they are crossed. The evolutionary significance of the mutations is discussed.—*Auth. summ.*

24011. Villee, Claude A. (*Harvard U., Cambridge, Mass.*) A spectrophotometric analysis of the eye colors of *Habrobracon*. *Genetics* 32(3): 277-285. 1947.—The eye pigments obtained from wild type, white, ivory, orange, canteloup, carrot, dark carrot, and dark red *Habrobracon* were compared with those from *Drosophila melanogaster*. The *Habrobracon* heads were dissected the antennae removed, and the pigments extracted with the solvents used by Ephrussi and Herold, 30% ethanol acidified to pH 2 and absolute methanol acidified with 1% HCl. The light absorption of the various solns. was measured with a Beckman spectrophotometer in 10 mμ intervals from 300 to 625 mμ. The results indicated that none of the *Habrobracon* stocks has a red pigment similar to the one in *Drosophila*, but that all have a brown pigment similar to the brown pigment of *Drosophila*. The various colors in the several *Habrobracon* mutant stocks are due to differences in the quantity of the pigment or in the degree of oxidation or reduction of the pigment. The *Habrobracon* pigment resembles the brown pigment of *Drosophila* in all chemical properties tested: it is insoluble in water but soluble in acid absolute methanol; it is decolorized and apparently destroyed by alkali since treatment with acid does not restore the color; its color in acid methanol extract changes from brown to yellow on addition of peroxide and from brown to pink on addition of Na hydrosulfite.—*C. A. Villee.*

#### MAN

24012. Ashley, Laurence M. (*Coll. Med. Evangelists, Loma Linda, Calif.*) The inheritance of streblomicrodactyly. *Jour. Heredity* 38(3): 93-96. 3 fig. 1947.—Three new pedigrees of streblomicrodactyly (flexed little fingers) are described, 2 of which offer evidence supporting Hefner's hypothesis that multiple alleles may account for the appearance of both major and minor degrees of flexion in the same pedigree. The new charts are similar in that, in each, inheritance is from mother to son and from father to daughter. This, however, is considered to be of the usual irregular dominant autosomal type since there are too many affected ♀♀ for sex-linked recessive inheritance and too few affected ♂♂ for the rare dominant sex-linked type of heredity. No definite evidence was found to support Tomesku's claim for linkage between flexed finger and color of hair.—*Auth. abst.*

24013. Cotterman, C. W. (*U. Michigan, Ann Arbor.*) A weighting system for the estimation of gene frequencies from family records. *Contr. Lab. Vertebrate Biol. Michigan Univ.* 33: 1-21. 1947.—When all members of a family or other related group are counted as though unrelated, a fixed weight may be assigned each gene or individual in the aggregate, and the usual equations for estimating the population gene ratio may then be applied to the cumulated wts. The appropriate wts. for genes with and without dominance have been tabulated for families of various sizes, with neither, one or both parents recorded, and for pairs of relatives of any kind. This method of estimation, although simplifying calculation and permitting of an easier extension to complex groups of relatives, is generally inefficient and should be employed only when scores and wts. for the maximum likelihood solution are not available.—C. W. Cotterman.

24014. Dice, Lee R. (*U. Michigan, Ann Arbor.*) Report of the Director of the Laboratory of Vertebrate Biology 1945-46. 16p. *U. Michigan: Ann Arbor, 1946.*—A report on progress of research of the Laboratory of Vertebrate Biology. Included is a brief outline of the research in human heredity which is being conducted at the Human Heredity Clinic of the Univ. of Michigan.—H. H. Strandkov.

24015. Kemp, Tage. Danish experiences in negative eugenics, 1929-45. *Eugenics Rev.* 38(4): 181-186. 1947.—During this period Denmark sterilized 3,608, of whom 2,803 were feeble-minded. These 2,803 would have had > 5,000 children,  $1/3-1/2$  of them feeble-minded. In 100 yrs. they would have had several times 10,000 feeble-minded descendants. During the 6 yrs. of Denmark's "Interruption of Pregnancy Law," 623 cases have been operated, including physical malformations, various mental conditions, alcoholism and/or criminality, and combined eugenic considerations. There was unanimous individual and familial agreement. The principle is that too few operations are preferable to too many. Since 1938 the Institute for Human Genetics has maintained a nation-wide card index covering their families and all patients with serious hereditary affections. The success of these measures is due to the cooperation of the public services and justice. General practitioners must know thoroughly recent research results in medical genetics and the population must have some understanding of eugenic principles.—A. R. Middleton.

24016. Levy, L. II. (*Louisiana State U., New Orleans 13.*) Non-hemophilic hereditary hemorrhagic diathesis: Report of a family of bleeders. *Ann. Internal Med.* 27(1): 96-102. 3 fig. 1947.—A hereditary hemorrhagic diathesis affecting 20 members of a family during 5 generations was investigated. Both sexes were affected and either was capable of transmitting the bleeding tendency. These patients exhibited prolonged bleeding following minor trauma, with the majority experiencing epistaxis and bleeding from the gums. Bleeding from the lungs, gastrointestinal tract, urinary bladder, and uterus was also observed. Prolonged bleeding following tooth extraction, tonsillectomy, and appendectomy occurred. The only abnormal hematologic findings were a prolonged bleeding time and changes in the capillaries of the nailbeds of the fingers. Treatment consisted of local measures and transfusions. Four members died following pulmonary and uterine hemorrhages.—Louis Levy, II.

24017. Montagu, M. F. Ashley. (*Hahnemann Med. Coll., Philadelphia, Pa.*) The missing forearm muscle. A case of non-familial bilateral absence of the palmaris longus muscle in man. *Jour. Heredity* 38(1): 7-9. 1 fig. 1947.—Absence of the palmaris longus muscle in both forearms of an American white ♂, the living members of whose family all exhibit the muscle in well developed condition, suggests the action of a recessive gene. The cases hitherto described suggested the action of a single, probably, dominant gene subject to the action of modifiers. It is suggested that there are

probably a number of different genetic mechanisms involved in producing absence of this muscle. The muscle is one which particularly lends itself to genetic study in the living.—A. H. abst.

24018. Oliver, Clarence P. (*U. Minnesota, Minneapolis.*) A report of the Dight Institute for the year 1944-45. *Bull. Dight Inst. Univ. Minnesota* 4. 1-12. 1946.—This is the 4th annual report of the Dight Inst. at the Univ. of Minnesota. A brief summary is presented of the program of Human Genetics' research being conducted at the Institute, which includes a study of human breast cancer, congenitally missing teeth, feeble-mindedness, mongolism, amaurotic family idiocy, and cerebellar ataxia.—H. H. Strandkov.

24019. Pickford, R. W. (*U. Glasgow.*) Sex differences in colour vision. *Nature [London]* 159(4044): 606-607. 1947.—Confirms previous indication that red-green blindness is incompletely recessive. 191 men and 185 women with normal color vision were tested for red-green and blue-yellow sensitivity by the limiting method. There were no significant blue-yellow differences, and the red-green threshold modes were the same; but 18 more women than men showed more than twice the modal red-green threshold (probability 0.001). Women with known color-blind relatives had a still higher proportion of red-green weak individuals. The figures are in accord with expected proportion of heterozygotes in the population.—R. Walker.

24020. Roberts, Elmer. (*U. Illinois, Urbana.*) Biology and social problems. *Bull. Dight Inst. Univ. Minnesota* 4. 13-21. 1946.—The annual Dight Institute Lecture sponsored in collaboration with the Minnesota Mental Hygiene Society, delivered April 16, 1945. The general problem of Heredity and Environment is developed. Emphasis is placed on the importance of individual responsibility for the improvement of the social order as well as of the individual. In his concluding remarks Dr. Roberts asks: "May it not be as much of a duty of man to improve the social order biologically as it is to improve the environment in which he lives?"—H. H. Strandkov.

24021. Snyder, Laurence H. (*Ohio State U., Columbus.*) Studies in human inheritance. XXX. A gene frequency analysis of maternal-fetal incompatibility. *Jour. Immunol., Virus-Res. and Exptl. Chemother.* 56(3): 281-285. 1947.—Formulae are derived for obtaining the probability, in the general population, that a child will have inherited from the father, at a given locus, any allele which the mother lacks, but which produces a trait (e. g., an antigen) even when present only once at that locus. The generalized formula is extended to cover specifically antigens A, B, M and N, and the various Rh and Hr antigens. Using the frequencies of the genes for these antigens in the white American population, the specific probabilities are derived and presented.—L. H. Snyder.

24022. Stoddard, S. Edmund. (*Placer Coll., Auburn, Calif.*) Inheritance of malocclusion. *Jour. Heredity* 38(4): 117-119. 2 fig. 1947.—Classification and possible causes of malocclusion are summarized. In the present study, malocclusion has been traced through three generations. In the family surveyed in the present study, the trait behaves as an incomplete autosomal dominant. It is suggested that in malocclusion the mutated gene (or genes), acting in relationship to other modifying genes, gives us variable expressions to the trait. Although many other factors may be important in causing malocclusion, the present work stresses the possibility of heredity as a causal factor. In many families there are hereditary factors for malocclusion, and these are multiplied by environmental conditions. Parents having hereditary tendencies toward malocclusion should make it a point to watch for the eruption of the 1st molar teeth of their children. At that time, and periodically during adolescence, such children should have a check made as to their dental condition. By such action much faulty dentition might be avoided.—S. E. Stoddard.



## APPARATUS AND TECHNIQUE

PETER GRAY, *Editor*

(See also Entries 23963, 23974, 25139, 25140, 25141, 25143, 25144, 25145, 25147, 25148)

## MICROSCOPY AND TECHNIQUE

24023. Cole, W. V. (*Kirkville Coll. Osteopathy and Surgery, Kirkville, Mo.*) Quick staining method for frozen sections. *Stain Technol.* 22(1): 5-7. 2 fig. 1947.—This technic uses a glass "spot plate" containing a series of depressions in which the stains and other fluid agents are placed. Sections are transferred by means of a perforated section lifter.—*E. R. Noble.*

24024. Leach, E. H. (*U. Lab. Physiol., Oxford, Eng.*) Bismark brown as a stain for mucoproteins. *Stain Technol.* 22(2): 73-76. 1947.—It has been found that Bismark brown in slightly acidified, strong alcoholic, soln. stains mucin. A simple method is given for using this soln. for staining water-soluble mucoproteins. Another method is included in which full precautions are given for avoidance of water at all stages subsequent to fixation. This method must be used for the more water-labile mucoproteins. By the use of these methods, it has been possible to demonstrate a wide range of mucoproteins including those of the mast cells of Hardie and that of the zona pellucida of the graafian follicle.—*Auth. abst.*

24025. O'Brien, J. P. (*Prince Henry Hosp., Sydney, Australia.*) Paraffin sections of tissue fragments. *Stain Technol.* 22(2): 71-72. 1947.—Fragments of tissue are retained in a single test tube 1 cm. in diam. and 6-8 cm. long. By the use of a centrifuge and pipette after treatment with each reagent, the tissues in the tubes are subjected in turn to the chosen dehydrating and clearing reagents and paraffin. After removal of the cork, the bottom of the tube containing paraffin is snapped or broken off. The circular shape of the block is not a disadvantage in sectioning.—*E. R. Noble.*

24026. Smith, Luther. (*State Coll. Washington, Pullman.*) The acetocarmine smear technic. *Stain Technol.* 22(1): 17-31. 4 fig. 1947.—The acetocarmine smear technic is descr. primarily for beginners. An effort was made to bring together into one paper the work-a-day details to be followed in collecting specimens and making preparations of plant chromosomes at prophase, of condensed chromosomes at meiosis and mitosis (including mitosis in microspores), and of coiled chromonemata. A schedule for converting temporary slides into permanent mounts is given, and a technic for making smears of the chromosomes in the salivary glands of *Drosophila* is descr.—*Auth. summ.*

24027. Stowell, R. E., and Anita Zorzoli. (*Wash. U. Sch. Med., St. Louis, Mo.*) The action of ribonuclease on fixed tissues. *Stain Technol.* 22(2): 51-61. 1947.—To study the optimal conditions for histochemical use of ribonuclease on fixed tissues, the factors of (1) type of fixation, (2) temperature, pH, type of buffer and length of incubation, (3) concentration of enzyme, and (4) staining and dehydration of sections were observed on rabbit pancreas. The fixing fluids

studied were sublimate-alcohol, Bouin's, Zenker-acetic, Zenker-formol, Petrunkevich's cupric-paranitrophenol, 10% neutral formalin, SUSA, Carnoy, Bensley's chrom-sublimate, absolute ethyl alcohol and acetone. Formaldehyde was a satisfactory fixative, although others might be preferred for special purposes. Of the five buffers tested, McIlvaine's citric-acid-disodium-phosphate mixture was the most satisfactory. The optimum concentration of ribonuclease and length of incubation varied greatly after the 11 different types of fixation. Until the degree and optimum conditions of specific action have been more precisely established by further experiments, it is suggested that this histo-chemical reaction only be interpreted as a confirmatory test which is, under the best conditions, only relatively specific for ribonucleic acid and not highly quantitative.—*Auth. abst.*

## LABORATORY APPARATUS AND TECHNIQUE

24028. Lane, W. R. A microburette for producing small liquid drops of known size. *Jour. Sci. Instruments* 24(4): 98-101. 3 fig. 1947.—Drops of uniform diameter ( $\approx 3\%$ ) are formed at the tip of a hypodermic needle around which is flowing a concentric stream of air. By varying the speed of the air, the size of the drops delivered can be varied over a wide range (0.3 to 1 mm. diam.).—*R. L. Weintraub.*

## PHOTOGRAPHY

24029. Jones, F. T. (*Western Region. Res. Lab., Albany, Calif.*) Shutter shadow in photomicrography. *Jour. Biol. Photogr. Assoc.* 15(4): 193-194. 1 fig. 1947.—A spiral pattern sometimes appears on photomicrographs when the shutter opens and closes too slowly and the light beam is large. This is greater at rapid than with slower exposures and means for avoiding it involve slower exposures.—*O. W. Richards.*

24030. Oliver, Clayton B. (*Wayne U., Detroit, Mich.*) Color correction for precise copying with tri-pack materials. *Jour. Biol. Photogr. Assoc.* 15(4): 195-197. 1947.—The compensation required is determined by underexposing a clean area of the stock upon which the original is placed to the proper degree to produce the required medium density, together with the taking of trial exposures with the various color compensating filters to produce a neutral grey tint at that density. Trial exposures are made to determine the over-all final transparency density and/or color intensity.—*O. W. Richards.*

24031. Sass, John E. (*Agric. Expt. Sta., Ames, Iowa.*) A photographic apparatus for use with Micro Tessar objectives. *Jour. Biol. Photogr. Assoc.* 15(4): 198-200. 1 fig. 1947.—A horizontal apparatus, with ribbon filament lamp, filter holder, stage, matching substage condensers, and  $4 \times 5$  camera mounted on an optical bench is described with directions for use.—*O. W. Richards.*

## PHYSICAL ANTHROPOLOGY

W. M. KROGMAN, *Editor*

(See also Human Biology; and Entries: Wrist muscles, 24720; Effect of temporal muscle on form of the mandibles, 25008; Morphology of the spinal cord, tail segmentation, and caudal musculature of monkeys, 25033; Variations in fracture resistance of diaphyses at various ages, 25138; Anomalies in cadaver, 25175)

24032. Borch, O. (U. Oslo.) Somatologiske og hygieniske studier blant norske studenter. 2. Helse og hygiene. [Somatological and hygienic studies on Norwegian students. 2. Health and hygiene.] *Nordisk Hyg. Tidsskr.* 21: 81-88. 1940.—The general health conditions were, on an average, most satisfactory among the well-to-do students. Conditions were better among the younger students than among the older ones. Similar relations were found in respect to physical carriage which, generally, was not wholly satisfactory. Evidently the studies impair the general health. The students' mode of living, their working hours and nutrition are also discussed.—H. E. Ottosen.

24033. Büchi, E. C. Die Skelettfunde aus der Wasserkirche in Zürich (12. Jahrhundert.). *Bull. Schweiz. Ges. Anthropol. u. Ethnol.* 22: 62-89. 4 pl., 3 fig. 1945/46.—3 ad. ♀♀, 1 ad. ♂. Homogeneous; oligencephalic to arisencephalic; mesocranial; hysicranial; narrow forehead in ♀♀, medium-broad in ♂; face, orbits, nose very narrow and high. Extremities slender, stature moderately tall. Probably a family grave. They more nearly approach the Zurichers (8th cent.) than the Bubikoners (12-18th cent.), yet are distinctive. Beside the tables, all individual measurements are given.—E. W. Count.

24034. Castaldi, Luigi. (U. Cagliari.) Confronti encefalometrici. [Encephalometric comparisons.] *Arch. Ital. Anat. e Embriol.* 47: 95-134. 4 fig. 1942.—All the encephalometric data, obtained by the method of Ariens Kappers on brains of various peoples and given by various authors, are compared in this paper. It is concluded that encephalometric indexes and angles show both individual and racial variations bound to the general encephalic width-length ratio and to the other general height-length ratio; but besides this, local variations may be observed in the various encephalic segments and particularly on the details, which are diff. and characteristic for each racial group. Sex, age, constitutional type, somatic size and asymmetries between the right and the left side may be other causes of these variations.—M. A. Barbasetti.

24035. Clark, W. E. Le Gros. (Univ. Mus., Oxford, Eng.) The premaxilla and the ancestry of man. *Nature [London]* 159(4042): 546. 1947.—After studying Australopithecine material in S. Africa in the light of Wood Jones' theory on the premaxilla, author agrees with Dart and Broom on the importance of the Australopithecinae as an index to the ancestry of *Homo*.—R. Walker.

24036. Dupont, R., et N. Kossovitch. Contribution à l'étude de la répartition des groupes sanguins chez quelques tribus des régions occidentales et centrales de l'A.E.F. *Compt. Rend. Soc. Biol.* 135: 523-524. 1941.

24037. Lisi, G. de. (U. Perugia, Italy.) La Biometria in rapporto all'ostetricia: studio biometrico statistico su caratteri esterni di 512 neonati a termine di sviluppo. [Relations between biometry and obstetrics: biometric-statistical study on the external characters of 512 completely developed newborn children.] *Riv. Biol.* 30: 1-20. 1940.—Statistical data are reported on the external characters of 512 newborn ♂ and ♀ children observed at the Obstetric Clinic of Perugia. A high anthropological homogeneity among the population of the Umbrian region was demonstrated by the examination of the following characters: W, H, lgth. of limbs, and diam. of the head, thorax and pelvis.—L. Tentori.

24038. Matiegka, J. *Homo předměstensis, fosilní člověk z předměstí na Moravě*. II. Ostatní části kostrové. [Fossil man of Předměstí in Moravia. (Czechoslovakia). II. Other parts of the skeleton.] [With Fr. summ.] 91 p. 17 pl. Czech Acad. Sci. and Arts: Prague, 1938.—The detailed anthropometry of individuals III, IV, IX, X, XIV, supplemented occasionally with I, II, V, VII, and compared when possible with various extant peoples, particularly Andamanese, Japanese, Australians, Europeans, Negroes, Santa Rosa Islanders (Calif.), Hawaiians. The Předměstí series affords data on practically all parts of the skeleton, and a large portion of these are illustrated photographically. The skeletons con-

firm the cranial evidence that the type closely approaches the Crô-Magnon, although certain characters of some individuals diverge from that type. Předměstí skeletons also resemble in many ways recent primitive non-Europeans; but these ways are determined not genetically but environmentally. For Part I, See Matiegka, J.: *Homo Předměstensis*. I. The Crania. Czech. Acad. Sci. and Arts: Prague, 1934.—E. W. Count.

24039. Matson, G. Albin. (U. Utah. Med. Sch., Salt Lake City.) Anthropological application of the blood groups. *Proc. Utah. Acad. Sci. Arts and Lett.* 23: 19-27. 1946.—A review of the literature on blood groups as related to anthropology is given and 72 refs. cited. The Amer. Indians, most of whom belong to group O, except the Blackfeet, most of whom are group A, are particularly discussed. The blood groups of mummies can be satisfactorily detd., but analysis of skeletons has not always been successful. Racial distribution of M, N, P, Rh and Hr factors, and secretors, is also discussed.—D. H. Galway.

24040. Mercedes, Rodrigo B. Tipos especiales de niños. [Special types of children.] *Rev. Fac. Med. [Bogotá]* 15(4): 243-260. 1946.—Discussion of diff. types of children above and below the general measure. Considerations on children in war time, especially during the Spanish civil war.—Paul Engel.

24041. Salzmann, J. A. Measurement of the Frankfort-Mandibular Plane Angle, the Frankfort-Orbital Plane Angle and the Incisor-Mandibular Plane Angle. *Jour. Dental Res.* 25(5): 418. 1946.—An abstract.

24042. Sauter, M. R. Anthropologie de la Suisse italienne. *Bull. Schweiz. Ges. Anthropol. u. Ethnol.* 22: 96-114. 5 fig. 1945/46.—This mass of material from Chironico, Tessin, could not be sorted into individuals, but it could be treated statistically. Both sexes are present. The period is uncertain, but is probably mediaeval. Racially they were Mediterranean, except for the probably ancient hybridization which did away with dolichocephaly. They have persisted to today, in spite of Alpine and Dinaric invasion. The material is compared with Tessin, northern Italy, mediaeval Geneva. There is a fair amt. of data tabulated but not in numbered tables.—E. W. Count.

24043. Tallmadge, G. K. (Marquette U., Milwaukee, Wis.) Anatomic observations. *Arg. Anat. e Antropol. [Lisbon]* 20: 89-96. 4 fig. 1939/1940.—Of 2 instances of the presternal muscle reported by the author, one was unilateral, but the 2d was of greater interest since it was bilateral and more highly developed on the R. instead of the L. side. Of 2 arterial variations reported, the first showed that in place of the usual relatively small A. subscapularis there arose from A. axillaris a single very large trunk; the 2d presented an abnormally high bifurcation of the brachial artery into the usual radial and ulnar.—W. A. Lessa.

24044. Tichelman, G. L. Some notes on the Central Batak Country. *Bull. Colon. Inst. Amsterdam* 3(3/4): 189-198. 1940.—This is a popular article on the Bataks themselves, rather than their country, as the title implies. The Bataks show anthropological features relating them to a pre-Davidian portion of the Munda tribes of the Chota-Nagpur plateau of India. An old people of the East Indian Archipelago, the Bataks indicate mixed negroid-veddoid strains. Patriarchy dominates their social and economic lives. The village (hoeta) is the social heart. Their plan of physical organization varies, except that as symbolic acknowledgment of the powers of nature, houses face one way—that direction from which water flows. Rice barns are perpendicular to the flow. The idea is that men must acknowledge the potency of nature by placing nothing in her way. The perpendicular position of the rice barn "prevents the real essence of the rice from escaping". Obviously mystics and extremely fatalistic, their material progress is thus hampered, for the Batak accepts adversity as a proper state of affairs, impossible of modification. Lately, many have taken to western education. Ba-

taks are not a homogeneous whole. Linguistically, they may be divided into several groups, which from the scientific point of view constitute dialects, although in practice the groups do not understand one another.—*A. C. Antret.*

24045. Toiari, Ezio. (*U. Bologna.*) *Ricerche sulle proprietà istomeccaniche dei tavolati della volta cranica in rapporto alla patogenesi delle loro fratture.* [The histological and mechanical properties of the cranial vault in relation to the pathogenesis of their fractures.] *Arch. Ital. Anat. e Embriol.* 47: 832-853. 1 fig. 1942.—The resistance to fracture and the fragility were detd. and the structure studied in calibrated fragments of the inner and outer portions of the skull vault bones at various ages. The tissue forming these bones is more compact in the outer portion than in the inner one facing the diploë. The inner lamina is more porous than the outer, and porosity increases with age; the increase of

fragility and the lessened resistance to fracture are attributed to this, and to chemical and physical changes. The inner lamina shows less resistance to flexion than the outer; this may be dependant on the diff. porosity, but it is mainly due to the architecture of the 2 laminae and to the disposition of porosity in relation to the direction of the fracturing force. These results and the fact of the chemical identity of the 2 laminae suggest that the pathogenetic mechanism of the incomplete fractures of the skull vault varies according to the form, size, and force of the fracturing material, this variability showing particularly in the fractures of the lamina directly hurt, while the isolated fracture of the lamina facing the struck one is dependant on the non-homogeneous disposition of porosity, on its orientation, on the lesser thickness of the compact portion of the inner lamina, and on the rise of bursting forces in the diploë.—*M. A. Barbasetti.*

## HUMAN BIOLOGY

EARL W. COUNT, *Editor*

(See also Physical Anthropology; Genetics, Man; Geriatrics; and: Biology and social problems, 24020; Animal behavior and human biology, 24061; Climate and comfort, 24068; Prewar nutrition in rural China, 24410; Nutrition research in China, 24411; Nutrition in rural Greece, 24429; Nutrition problem in Mexico, 24430; Nutritive value of U. S. food supply, 24438; Malnutrition in Italy, 24441; Problems of gerontology, 24874; Progress in cancer control, 24938; Mortality among the wounded, World War II, 25550)

### POPULATION, FERTILITY, VITAL STATISTICS

24046. Crew, F. A. E. (*U. Edinburgh, Scotland.*) *The measurement of the health of a population.* *Pharmaceut. Jour.* 157(4335): 339-340. 1946.—The I.Q. in 6 socio-economic groups is discussed, and some questions as to the precise and actual meaning of the I. Q. are raised, relative to socio-economic status.

24047. East, W. Norwood. *The non-sane non-insane offender.* *Eugenics Rev.* 39(1): 6-16. 1947.—The non-sane non-insane comprise subnormals, psychopathics and sychoneurotics, but the mental classification of individual offenders is not difficult except where the characteristics of groups overlap or are superimposed. However, our knowledge permits sufficient differentiation of the various subgroups for the psychiatrist to diagnose correctly and to propose and carry out the appropriate course of treatment. Since these offenders closely resemble ordinary offenders at one extreme and approach insanity at the other, culpability differs in degree among individuals of the group. Whether the psychiatrist's advice is accepted depends upon its possible effect upon the offender and public security if medical treatment is adopted in lieu of, and not as an adjunct to, a prison sentence. For these offenders a special penal institution is required combining prison features with those of a mental hospital and giving training and specialized medical treatment. A colony-like nexus would give elasticity to the therapeutic and demophtic purposes of the institution. Short sentences usually given in cases of exhibitionism and sexual assault on young children are useless. Sentences approximating the legal maximum may be needed to ensure special treatment. Intentionally such sentences, through restricting fertility, would have some eugenic value.—*A. R. Middleton.*

### BEHAVIOR—SPEECH DISORDERS

24048. Bierman, Jessie M., and Donald R. Caziarc. (*State Dept. of Publ. Health, San Francisco, Calif.*) *The California Hearing Conservation Program.* *Amer. Jour. bl. Health* 37(4): 407-411. 1947.—The program of hearing conservation for children in California developed by the State Departments of Health and Education emphasizes pre-

vention of conditions leading to hearing loss through case finding among school age and pre-school age children by phonograph and puretone audiometer testing, otological diagnostic clinics, medical and surgical treatment, purchase of hearing aids, and referral for special education. Treatment for children whose families require financial help is provided under the Crippled Children's Services with which the program is integrated. The State Department of Health prescribes qualifications and registers school audiometrists.—*J. M. Bierman.*

### MISCELLANEOUS

24049. Emerson, Alfred E. (*U. Chicago.*) *The biological basis of social cooperation.* *Trans. Illinois State Acad. Sci.* 39: 9-18. 1946.—The address of the president of the Academy, 1945-46. He attempts to show that man is a "rational rather than a rationalizing animal" and his intelligence can be used as a guide for social evolution. For the purpose of his discussion, he groups the various interspecies relationships into four categories—mutual harm or disoperation, unilateral benefit including conflict and competition, mutual harmlessness or toleration, and mutual benefit or cooperation and concludes his address with what biological principles emerge from these considerations and shows the validity of these principles in building a social philosophy.—*Greta Oppe.*

24050. Slater, Elito. *A note on Jewish-Christian intermarriage.* *Eugenics Rev.* 39(1): 17-21. 1947.—Anti-Semitism is a common field where people with many different antipathies can be in agreement. If Jewish families remained rooted in one country, mixing freely with its natives, cultural differences would disappear. Physical and psychological traits could be dissipated by intermarriage. The small sample of 50 hospitalized Jewish soldiers is possibly not too representative, but the study indicates that social differences are being dropped and the frequency of Jewish-Christian marriages has increased to about 1 in 8. If maintained for a number of generations, assimilation of the Jewish and non-Jewish populations would occur and anti-Semitism disappear in Britain.—*A. R. Middleton.*



## ANIMAL BEHAVIOR

T. C. SCHNEIRLA, *Editor*

(See also B. A. 21(9): Sexual behavior, *Drosophila*, 21281; Hereditary differences in susceptibility to audiogenic seizure, mice, 21297; Vertical migration of plankton copepod, 21406; Potato beetle attrahent in potato foliage, 23455; Predation and feeding in *Pseudoscorpiones*, 23714; Nesting behavior in wasps, 23810; Courtship of snake, 23853; of penguins, 23893; and in this issue: Modification of brain and endocrine glands, as explanation of altered behavior trends in Norway rat, 24006; Self selection of diets, rats, 24450; Pharmacological methods in the study of overt behavior, 24839; Earth-licking in animals with mineral deficiency, 25599; Temp. control of diapause in wheat sawfly, 26095; Influence of temp. on activity of honeybees, 26153; Flight and flower-visiting behavior of honeybees, 26154; Combat behavior in *Hercules* beetle, 26377; Homing in snakes, 26488; Function of bird song, 26522; Torpidity in birds, 26526; Mating behavior of birds, 26540)

24051. Baudouin, Marcel. Une observation de sommeil d'été de type hibernale suivi de mort, chez l'écureuil (*Sciurus vulgaris* L.). [An observation of summer sleep of the hibernation type in a squirrel.] *Bull. Soc. Sci. Nat. Ouest France* 8(1/4): 7-10. 1938.—Report on a captive *S. vulgaris* which early in July passed into a coma resembling hibernation, gradually aroused itself after about a month until it was as lively as ever, and then suddenly relapsed into sleep and died 2 days later. Autopsy showed a brain congestion, and a dilation of the stomach (which was empty). The author believes that the animal died of starvation caused by its sleep, but cannot account for the onset of the sleep itself.

24052. Dijkgraaf, Sven. (U. Groningen.) Ueber die Auslösung der Fluchtreaktion bei Fliegen. [Provocation of the flight-reaction of flies.] *Experientia* 3: 34-35. 1947.—When flies dart away from the catching hand, the reaction is due to optical stimuli alone. Air movements play no part in this connection.—R. Jeanloz.

24053. Felsing, J. M., A. I. Gladstone, H. G. Yamaguchi, and C. L. Hull. (Yale U., New Haven.) Reaction latency (*str*) as a function of the number of reinforcements (N). *Jour. Exptl. Psychol.* 37(3): 214-228. 1947.—59 albino rats, 12 to 14 weeks of age at the beginning of training, were taught to push a short horizontal bar to the left for a reward of a small cylinder of relished food automatically delivered at once following the response. Trials were made once every 24 hrs., after a 22-hour no-feeding interval. Training was continued until reaction latencies, graphically recorded, had ceased to decrease. For the median animal this plateau came at about the 60th trial. Both the reaction latencies of individual distributions were markedly skewed, their modes falling near the short latency end. The median latencies (*str*) of the group as a whole (with data equalized for individual differences in rate of learning) were found to have the functional relationship to the number of reinforced training trials (N) which is well fitted by the equation,  $str = 33.0 N^{-1.2} - 0.25$ .

24054. Heumann, G., J. Jacobsohn, et V. Vilter. (Fac. Méd., Clermont-Ferrand, France.) Causes biologiques de l'inversion de la nage chez le *Synodontis batensoda*. Étude faite en rapport avec l'inversion de la polarité pigmentaire. [Biologic causes of the inversion of swimming in *S. batensoda* in relation to inversed pigment polarity.] *Compt. Rend. Soc. Biol.* 135: 661-662. 1941.

24055. Krushinsky, L. V. Nasledstvennoe "fiksirovanie" individualno priobretennovo povedeniya zhivotnykh prioskhozhdennye instinkty. [Hereditary "fixation" of individually acquired forms of behavior of animals and the origin of instincts.] *Zhurnal Obshchei Biologii (Jour. Gen. Biol.)* 5(5): 261-283. 5 fig. 1944.—Data obtained in training dogs to carry objects in their teeth and in the investigation of passive defense reflexes were used to elucidate the role of non-hereditary factors in the formation of "innate" reactions. Analysis of formation of passive defence behavior showed that this reaction arose in close dependence upon the genotype of the dog. When an individually acquired and biologically useful mode of behavior arises in a population, natural selection substitutes intrinsic factors for extrinsic ones initially underlying the formation of this behavior. This follows from the fact that the manifestation of certain behavior in response to given external stimulation occurs more easily the more the behavior is in accord with the genotype of the animal. Hence it is necessary to select the genotypes which would maximally promote the formation of this mode of behavior by replacing extrinsic with intrinsic factors. In this way the evolution of innate instinctive behavior patterns follows the course of individually acquired behavior. Con-

siderations are advanced by the author concerning the way in which innate instinctive forms of behavior may be established.—G. Oster.

24056. Piéron, H. (Hôtel Dieu, Paris.) Sur l'accélération, avec la température, de l'évolution des processus mnémoniques. [Acceleration of the evolution of mnemonic processes by temp.] *Compt. Rend. Soc. Biol.* 135: 631-635. 1941.

24057. Rapoport, Anatol. (U. Chicago, Illinois.) Mathematical theory of motivation interactions of two individuals. II. *Bull. Math. Biophys.* 9(2): 41-61. 1947.—The behavior of 2 individuals, consisting of effort which results in output, is considered to be determined by a satisfaction function which depends on remuneration (receiving part of the output) and on the effort expended. The total output of the 2 individuals is not additive, that is, together they produce in general more than separately. Each individual behaves in a way which he considers will maximize his satisfaction function. Conditions are deduced for a certain relative equilibrium and for the stability of this equilibrium, i.e., conditions under which it will not "pay" the individual to decrease his efforts. In the absence of such conditions "exploitation" occurs which may or may not lead to total parasitism.—Auth. summ.

24058. Shurrager, P. S. (Illinois Inst. Technol., Chicago.) A comment on an attempt to condition the chronic spinal dog. *Jour. Exptl. Psychol.* 37(3): 261-262. 1947.—A reply to the paper by Kellogg, Deese, Pronko, and Feinberg in which failure to demonstrate conditioning in chronic spinal dogs is reported. The author agrees that the phenomena described by Kellogg and his co-workers are not conditioned responses, since they do not conform to the following criteria of conditioning: the CR is not evoked by the CS prior to conditioning; the CR appears and becomes firmly established as conditioning is continued; the CR is extinguishable; and the CR is not regularly subject to spontaneous recovery. The responses described by Shurrager meet these criteria. The divergence in findings are attributed to various different conditions in the studies.—P. S. Shurrager.

24059. Thorpe, W. H., and D. H. Wilkinson. Ising's theory of bird orientation. *Nature [London]* 158: 903-904. 1946.—Ising suggested that the sensory basis of direction-finding in the migratory and homing behavior of birds might be due to stimulation of the vestibular mechanisms by a Coriolis force generated by the rotation of the earth. Observations on liquid in a ring-shaped tube show that the Coriolis force produces a streaming movement in the fluid and a couple acting on the ring. The present authors question whether the magnitude of the forces involved is sufficient to compete adequately with the Brownian agitation energy of the sensitive hairs of the avian vestibular apparatus or with the effects due to motion of the head. Also, according to the theory, birds with larger semicircular canals (larger either absolutely or in relation to body size) should be more efficient in migratory or homing flights, but a review of available evidence suggests that this is not necessarily the case.—A. C. Hoffman (courtesy Psychol. Absts.).

24060. Vesey-Fitzgerald, Brian. The senses of bats. *Endeavour [London]* 6(21): 36-41. 8 fig. 1947.—A popular account of recent work on supersonic location mechanisms in bats. Plates show bats in flight.—G. W. Sinclair.

24061. Whitty, C. W. M. Animal behavior and human biology. *Rassegna Biol. Umana* 1(2): 33-36. 1946.—Citation in review particularly to Zuckermann and to Carpenter (et al.) to show that animal behavior furnishes both materials and new problems in the study of human behavior.—E. W. Count.

24062. Wragge Morley, D. Division of labor in ants. *Nature [London]* 158: 913-914. 1946.—“The mechanism of the division of labor depends on the reaction of the individual ant. . . when 1 ant responds to a stimulus, the other ants in

close proximity to it are stimulated to similar reaction unless they are already reacting to a stronger stimulus, or their response to that particular stimulus is already fully satisfied”.—*A. C. Hoffman (courtesy Psychol. Absts.)*.

# ECOLOGY

Editors

ORLANDO PARK, *General Animal Ecology*  
G. D. FULLER, *General Plant Ecology*  
G. EVELYN HUTCHINSON, *Hydrobiology (Oceanography, Limnology)*

L. A. SANDHOLZER, *Ecology of Wildlife Management—Aquatic*  
GEORGE A. PETRIDES, *Ecology of Wildlife Management—Terrestrial*

ROBERT G. STONE, *Bioclimatology, Biometeorology*

(Other entries in this issue: [GENERAL AND ANIMAL ECOLOGY]—Temp. control of diapause in wheat sawfly, 26095; Temp. range for incubation of tsetse pupae, 26191; Crabs of Central America, 26334; Water-conserving mechanism, insect egg, 26358; Transpiration in Arthropods, 26360; Alpine Coleoptera, 26388; Cave beetles, 26391; Ecology of Pselaphidae, 26395; Lepidoptera of Finland, 26434; Herpetofauna of N. Dakota, 26475; Growth of toads, 26482; Population of snakes, 26487; Burrowing lizard, 26489; Bird parasitism, 26504; Birds of Guinea, 26508; of Spain, 26514; of N. S. Wales, 26520; Winter birds of Georgia, 26515; Bird migration in Europe, 26521, 26536, 26538; Torpidity in birds, 26526; Seed distr. by birds, 26528; Avifauna of the Croisic Peninsula, France, 26529; Desert mammals, 26547; Coat color in hare, 26553. [PLANT ECOLOGY]—Vegetation and climatic zones of Belgium, 24063; Sociology of lake plants, 24099; Sandsteppe vegetation of Skåne, 25640; Pollination in *Salvia pratensis*, 25672; Soil conservation, India, 25750; Insect pollination of alfalfa, 25817; Role of lichens in soil formation, 25879; The shipmast locust, 25944)

## BIOCLIMATOLOGY, BIOMETEOROLOGY

(Other entries in this issue: Tree ring chronology, Mackenzie Delta, 24078; Microclimate and vegetation of chaparral, 24082; Temp. effects on the stability of cobra venom and cardiotoxin, 24859; Electric moisture meter, 25763; Hail injury to corn, 25774; Hail damage to sugarcane, Australia, 25843; Water content and thermal relationships in soils, 25888; Szechwan, 25941; Climate of São Paulo, Brazil, and relation to "tristeza" of citrus, 26052; Temp. control of diapause in wheat sawfly, 26095; Influence of temp. on activity of honeybees, 26153; Temp. range for incubation of tsetse pupae, 26191)

24063. Boudru, M. Les zones climatiques en Belgique. *Communic. Sta. Rech. Groenendaal* A-4. 9-13. Map. 1942. —Rubner distinguishes 3 climatic zones in Belgium: (1) A cool mountain climate with growing period <120 days, characterized by spruce, in the high Ardennes; (2) a moderate mountain climate with 120-180 days growing period, characterized by fir, in the lower Ardennes and lower Luxembourg; and (3) a warm temperate lowland climate with growing period >120 days, in the rest of the country. The author agrees with this classification except that (1) and (2) should be combined, for the growing period in the high Ardennes, according to 1928-1939 records, is >120 days and the coolest month is warmer than Rubner specifies for the cool mountain zone (-2° to -7°C).—*W. N. Sparhawk.*

24064. Craddock, George W. (Interm. Forest and Range Expt. Sta., Ogden, Utah.) Salt Lake City flood, 1945. *Proc. Utah Acad. Sci. Arts and Lett.* 23: 51-61. 1946.—A destructive flood occurred in Salt Lake City, Utah, at about 10:30 p. m. on Aug. 19, 1945. Flood waters issued from Perry's Hollow, Valley View Canyon, and a small basin between the 2, which drain a total of about 1 sq. mile. These basins lie n. of Wasatch Boulevard near the City Cemetery. Maximum flood flows of 4,000 cu. ft. per sec. per sq. mile were estimated. No previous floods from Salt Lake City watersheds were recorded during past 98 yrs. Flood waters carried large quantities of rock gravel, and debris onto Wasatch Boulevard and adjoining streets, on sidewalks, gardens, in garages and homes. Monetary value of damages was detd. by the U. S. Engineer Corps as \$347,000. There were no rain gages within the flood-contributing area, but rainfall during Aug. 13-20 at Salt Lake City stations varied from 1.52 to 3.33 inches. 10% of the watershed was literally devoid of vegetation and litter. 80% of the area was burned in the fall of 1944, removing all the litter and greatly reducing effective plant cover. The remaining 10% had a cover including oakbrush (*Quercus gambellii*), native perennials, and cheatgrass (*Bromus tectorum*), also an almost complete litter mantle. The most deteriorated slopes were riddled by the flood with a dense detritic pattern of gullies 1-6 inches wide and 1-10 inches deep. In many places soil was stripped to bedrock. Nearby areas with good plant cover showed no floods. Conclusions are: The flood was caused by coincidence of high rainfall and impaired watershed; probably no flood would have occurred if plant cover had been good; frequent violent floods can be expected in the future; prevalence of cheatgrass (*Bromus tectorum*) has increased fire hazard on the mountains; future floods may be minimized

by breaking up gullies, by fire prevention, and by channel improvements.—*D. H. Galway.*

24065. Hallgren, Gunnar. (Roy. Agric. Coll. Sweden, Uppsala.) [Studies on the influence of precipitation on crop yields in Sweden with special reference to field irrigation.] *Lantbrukshögskolans Annaler* 14: 173-289. 1947.—The author made a study of the relationship between precipitation and the yield of a number of field crops. The investigations were carried on to determine for what crops and areas irrigation could be used to advantage. The investigations were based on crop yields obtained from the farms of 9 agric. schools located in different parts of the country. Yields of cereals, potatoes, root crops, clover and grass were studied from the data of 40 yrs. In general there was a pronounced correlation between precipitation and temp. For the spring-seeded grains, the precipitation during May and June proved to be the most essential factor. Variations in precipitation during May and June were of little importance for the development of potatoes. The optimum proved to be close to the av. precipitation for the different localities. On the farms in southern Sweden there was a definite relation between the yield of root crops and the precipitation during May and June but the variations in precipitation during July and Aug. appeared to be of little importance. For the opt. production of grass and clover, an increase in precipitation is necessary. In the irrigation expts. the author found that the effect of irrigation in central Sweden was 40-50% of the effect produced by precipitation. The meadows will require 110 mm. of rainfall during May and June, barley 50 mm., and oats 60 mm.—*A. L. Bakke.*

24066. Hernández-Pacheco, Francisco. Las regiones climatológicas naturales de España en relación con la construcción rural. [The natural climatological regions of Spain in connection with rural construction.] *Bol. R. Soc. Española Hist. Nat.* 39(1/2): 47-65. Map, 5 pl. 1941.—Precipitation and temp. data, for the period 1921-1930, are given for 29 localities. Spain is divided into 10 natural climatological regions, and the characteristics of each are discussed. The plates show types of architecture in the different regions, adapted to the local conditions.

24067. Lukkala, O. J. Sateen mittauksia erilaisissa metsäkoissa. [Rainfall measurements in various stands.] [With German summ.] *Acta Forest. Fennica* 50(23): 1-13. 5 fig. 1942.—Continuous rainfall measurements have been carried out in stands of various tree spp. and density in s. Finland, during the period May-Oct. In a dense spruce stand, about 1/2 of the rainfall was caught by the tree tops; in stands of normal density, 20-30%. A larger proportion of the snowfall is caught by the trees. Spruce forest intercepts rainfall more than pine or birch forest.—*P. Mikola.*

24068. Matthews, B. H. C. Human ecology in relation to the physico-chemical factors. *Nature [London]* 158: 255-257. 1946.—This review of a symposium includes the topics: the optimal conditions of climate for human comfort, the physiology of men working in very hot environments, limiting conditions for psychological efficiency, reaction to low and high oxygen pressures, and similarities in human reaction to large changes in normal environment.—*A. C. Hoffman (courtesy Psychol. Absts.).*



24069. Săulescu, N., si N. Ceapoiu. Contributuni la harta canepii. [A contribution on hemp.] *An. Inst. Cercetări Agron. Român.* 15: 3-45. 1943.—To characterize the climate of the different regions in Rumania, and thus to determine which regions are favorable for hemp production, 3 factors—average temp., rainfall, and rainfall distribution—must be considered. These may be incorporated into a thermopluviometric index ( $P/T$ ) $R$ , in which  $P$  represents the total precipitation during the growing period of the hemp (April to Aug.),  $T$  the av. temp. for the same period, and  $R$  the number of days in the period in which there is at least 1 mm. of rainfall. An index of 500 to 1700 is favorable for hemp production though the optimum index is about 1000. Generally, areas with low indices are located in the steppes and regions with high indices are located in the mountains. Areas with the most favorable indices are found in the humid and subhumid regions where the rainfall exceeds 500 mm. during the growing period of the hemp.—*D. A. Russel.*

## ANIMAL

24070. Derbeneva-Ukhova, V. P. (Centr. Inst. Malar. Med. Parasit., Moscow.) Lichinki mukh-komponenty navoznykh biotsenozov. [Maggots in manure.] *Meditsinskaiâ Parazitologiâ i Parazitarnye Bolezni* [Med. Parasitol. and Parasitic Dis.] 11(3): 79-86. 1942.—The frequency of occurrence of the larvae of various spp. in the manure of horses, cows, calves, swine, sheep, and donkeys is indicated. A total of 17 spp. is recorded. The largest number of spp. was found in cow manure with litter and the next largest number in pure horse manure. The frequency of occurrence of several spp. of flies in large accumulations of horse manure and calf manure in Kabarda and the Archangel region is recorded. The following species are listed: *Musca domestica*, *Stomoxys calcitrans*, *Optura leuostoma*, *Cryptolucilia cornicina*, *Muscina stabulans*, *Hydroleae dentipes*, *Myosipila mediatubunda*.—*F. C. Bishop.*

24071. Hopp, Henry, and Paul J. Linder. (U. S. Dept. Agric., Beltsville, Md.) A principle for maintaining earthworms in farm soils. *Science* 105(2739): 663-664. 1947.—Earthworms in the plow layer were counted monthly, from Feb., 1946, to Jan., 1947, at the Maryland Agric. Expt. Sta. In plots cropped to corn annually, the earthworms increased during the growing season until early Nov., when a cold period killed most of them. During this period many of the earthworms in the rotation plots containing young wheat also died. In the rotation plots that contained a sod of wheat stubble plus legumes and grasses, the earthworms survived. At a nearby station a minimum temp. of 8°F was reached at this time. On land that was bare or contained young winter wheat, the soil froze to a depth of 4 inches, but under the sod and in plots covered with straw mulch, no freezing occurred. When the plots were resampled, many dead earthworms were found in those with frozen soil. Earthworms from a sod field were placed in soil with 40% moisture content, and samples were kept at various temps. The worms did best at 36°F, as judged by weight changes, but died at 32°F. In another test all worms died when subjected to 32°F. The results indicate that the death on the clean-tilled land in the late fall was caused by the sudden temp. drop to below 32°F. This effect can be alleviated by surface protection. Earthworms which had been protected withstood the cold and were active. Threshing residues, chopped corn stalks, composts, or manure, might be spread early in the fall after the row crop is removed.—*H. M. Kaplan.*

## PLANT

24072. Atkins, W. R. G. (Marine Biol. Lab., Plymouth, Eng.) Disappearance of *Zostera marina*. *Nature* [London] 59(4040): 477. 1947.—In a *Zostera* "meadow" in Guernsey 75-90% was lost in 1932; from then until 1938 the rest died its own though *Ophiobolus* was always present. Requests information on continued absence, regeneration, or biological substitution in bare areas.—*R. Walker.*

24073. Bigarella, João José. Contribuição ao estudo da anície litorânea do Estado do Paraná. [The littoral plain of the State of Parana, Brazil.] *Arg. Biol. e Tecnol.* 1: i-111. 1946.—A detailed presentation of the geographical feature of the littoral of the State of Parana in Brasil, with many new and noteworthy phyto- and zoogeographical observations. The paper is well documented with maps, profiles and photographs. New proofs are given of a recent uplifting of the coast, ancient mangrove formations, half fossilized (called mangrovites by the author) and "sambquis" (accumulation of shells, often with prehistoric relics of the Indians) are found above the present sea level, and at some distance from the present seashore. The vegetation of the dunes and beach ridges of the shore and the mangrove is briefly characterized.—*Felix Ravitscher.*

24074. Cottam, Walter P. (U. Utah, Salt Lake City.) Some bio-ecological factors of Utah and Britain contrasted. *Proc. Utah Acad. Sci. Arts and Lett.* 23: 83-90. 1946.—An appreciation of biotic features in a foreign land is enhanced if the traveler considers the factors which account for them. The ecologist soon learns that an organism must conform to its environment or perish. The interacting climatic factors which influence vegetation are summarized as water, temp., light, and air. England has average rainfall of 30 inches per year, about twice that of Salt Lake City. Vegetation is much more luxuriant but England has only about 1,285 spp. of flowering plants and ferns compared with >3,000 for Utah. Tropical plants such as figs and magnolias grow in England where frosts are few and late if they can endure the cold summers. These will not grow in Utah. The paucity of spp. in Britain is accounted for by its recent glaciation and separation from mainland.—*D. H. Galway.*

24075. Davidsson, Ingolfur. Grodur í Seydisfirdi. [The vegetation of Seydisfjörður.] *Náttúrufræðingurinn* 12: 24-44. 1942.—Seydisfjörður is situated on the eastern coast of Iceland. The land is mountainous and cut by firths. The sun is not seen from Oct. 12 to Feb. 18. The summer is misty and snow is deep in the winter. Here there is much "forest" of birch-copse, mountain ash (8-9 m. high) and coniferous trees such as *Pinus* and *Larix* (the latter ones are cultivated). In the valleys the vegetation is rich, *Saxifraga aizoides* and *Campanula rotundifolia* being the most conspicuous flowering plants. The plant list contains 231 spp. The life-forms from Seydisfjörður are compared with those of some other localities far around Iceland. The Mölholm-Hansen terminology is used.—*Doris Löve.*

24076. Davidsson, Ingolfur. Austan af Sida og Myrdals-sandur. [East of the Sida and Myrdalssandur.] *Náttúrufræðingurinn* 14: 89-96. 1944.—In July 1943, the author travelled around Sida and Myrdalssandur at Kirkjubæjarklaustur, southern Iceland. The district is partly lava from the Skaptá Volcano (erupted in 1783), partly "sandur", i.e., deserts of sand and stone overflowed by the unstable glacier rivers. After the lava had cooled off, lichens and mosses were the first vegetation. Thereafter the *Grimmia* heath was formed, and subsequently *Vaccinium* and *Calluna* associations began to form, or grasses occurred, according to the humidity of the ground. In depressions, fern thickets and flowering plants gather and at last copse and trees appeared. The Skaptá Volcano lava is mostly in the *Grimmia* stage. On the "sandur" *Elymus* seems to be the first inhabitant, followed by *Festuca rubra* var. *arenaria*, and soon there is a grassland. In the rivers grow different *Polamogeton* spp.—*Doris Löve.*

24077. Davidsson, Ingolfur. Stada Islands í gróður-beltaskipun jarðarinnar. [The position of Iceland in the vegetation belts of the world.] *Náttúrufræðingurinn* 15: 72-86. 1945.—After a survey of the vegetation belts of the world, the author places the highland of Iceland within the polar belt, but the lowlands in the temperate belt.—*Doris Löve.*

24078. Giddings, J. L. Jr. Mackenzie River delta chronology. *Tree-Ring Bull.* 13(4): 26-28. 1 fig. 1947.—Using cores from the trunks of *Picea glauca* growing in apparent good health on the banks of channels and swampy sloughs in the Mackenzie River delta, above latitude 67° N., the trees are found to live over 500 yrs. in many cases, though slightly rotted at the centers. At lower latitudes and farther up the river, trees >200 yrs. of age are exceptional and they do not show the growth features of the old delta trees, namely, spirally twisted trunks and a tendency to uniformity in ring width at all ages. The ring width does vary from year to year in the delta trees, apparently with the mean temp. of the growing season (July). Groups of trees, mostly >400 yrs. of age, show good cross-dating

(through mean ring widths) between 5 sites on the delta, with minor exceptions. A standardized mean ring width graph for the region is shown for the yrs. since 1460.—C. J. Lyon.

24079. Hotchkiss, Neil, and Robert E. Stewart. (U. S. Fish and Wildlife Serv., Laurel, Md.) *Vegetation of the Patuxent Research Refuge, Maryland.* *Amer. Midland Nat.* 38(1): 1-75. 1947.—This area of 2650 acres, located near the inland limit of the Atlantic Coastal Plain, was studied for 10 yrs. as a basis for research in wildlife management. The area has low relief, but associated with the Patuxent River flood plain and the adjacent terraces and upland are prominent differences in soils and water supply. Soil materials on the flood plain have been transported from the Piedmont Plateau. Other soils have originated mostly from the weathering in place of Coastal Plain sediments. Most of the soils are acid and have little organic matter. Artificial lakes have introduced a new environment since the study was begun. Succession on the flood plain begins with marsh-meadow and ends with river swamp. Alluviation may give rise to well-drained bottomland forest or may convert to bottomland forest any of the communities in the flood plain succession. Successions on the terraces and upland are secondary, most of the land having at one time been farmed, the remainder heavily cut over. On poorly drained land, wet meadow culminates in seepage swamp; on well drained land, fallow fields end in upland oak forest. Since this area was first occupied by white men much of the topsoil on the upland has been eroded and light and moisture conditions have been greatly altered, hence the forest vegetation is now less mesophytic than formerly. The known flora comprises 854 spp. of ferns and flowering plants.—Neil Hotchkiss.

24080. Hunt, Kenneth W. (Antioch College, Yellow Springs, Ohio.) *The Charleston woody flora.* *Amer. Midland Nat.* 37(3): 670-756. 1947.—An enumeration of 302 spp. and vars. of trees, shrubs, and vines collected within 25 miles of Charleston, S. C., with synonymy, statements of frequency and distribution, and incidental notes. Account is given for the region of the geology, the history of plant collecting, and present botanical activity. Special mention is made of the present status of the Michaux Garden. 12 plant communities are described, with lists of typical spp. and comments on economic utilization. Complete keys, a glossary, a bibliography, and an index are supplied.—K. W. Hunt.

24081. Johnsen, Baldur. *Groðurrikki Öraefa og Sudursveitar í Austur-Skaftafellssýsla.* [The vegetation of the Öraefa and Sudursveit in East Skaftafellssýsla.] *Náttúrufræðingurinn* 11: 54-63. 1941.—The author investigated the Öraefa and Sudursveit during 1924-1935. These 2 localities of southern Iceland are in continuous risk of being inundated by the tremendous water masses which flow down from the glaciers when the volcanos erupt and melt the ice. The areas are then covered by the fast streaming water for miles, and the vegetation is completely destroyed. As soon as the water has run off, plants begin to invade the vast area of clay, sand and stone. Here and there, little spots of *Arabis petraea*, *Arenaria ciliata*, *Rumex acetosa*, *Sedum acre* and *Saxifraga groenlandica* occur, and often *Epilobium latifolium* forms carpets. *Elymus* is rare. The sand is hard, rich in clay and stones. Where the vegetation has become a little older, grassland occurs, also near the glaciers (mostly *Poa pratensis* and *P. annua*). In the water there is very little vegetation, except for some *Equisetum* and pools with *Myriophyllum alterniflorum*, *Hippuris vulgaris*, *Potamogeton filiformis*, *P. alpinus* and *Scirpus pauciflorus*. The mountain slopes are covered by grassland and copse, in some clefts the fern thickets dominate. Rare plants are *Listera ovata*, *L. cordata* and *Ranunculus auricomus*. There is a flora list of 220 spp.—Doris Löve.

24082. Miller, Erwin H. (U. So. California, Los Angeles.) *Growth and environmental conditions in southern California chaparral.* *Amer. Midland Nat.* 37(2): 379-420. 1947.—Air temp., soil temp., evaporation rates, soil moisture and growth of the more common shrubs were measured from Dec., 1935, to Aug., 1938. Stations were located on n. and s. slopes at elevations from 1500 to 5500 ft. at 1000-ft. intervals. The types of vegetation included were coastal sagebrush, chaparral, and broad-sclerophyll woodland. Evaporation rates varied greatly from interval

to interval. The effect of altitude on these rates was slight, but slope exposure had a marked effect. The types of vegetation appear to be produced by slight climatic differences. Available soil moisture appears to be the controlling factor in determining the inception of growth in spring. Conditions at the cessation of growth varied only slightly from those at its inception. Air temp. range, evaporation rates and insolation seem to cause its cessation.—E. H. Miller.

24083. Rawitscher, Felix K., e Mercedes Rachid. *Troncos subterráneos de plantas brasileiras.* [Subterranean trunks of Brazilian plants.] *An. Acad. Brasil. Cienc.* 18(4): 261-280. 9 fig. 1946.—In the humid tropics where soils may be as much as 30 m. deep, some plants may develop enormous root systems, and may store water. In dry non-forested regions, physiology and morphology of the plants show such peculiarities as the xylopodia or subterranean trunk-like organs, with little more than leaves or inflorescences appearing above ground. Drying of the soil to considerable depths and surface temperatures of 60-70°C in sunlight are among the ecological factors concerned. Three such plants are described: *Jacaranda decurrens* (Bignoniaceae), which has a fern-like appearance; *Cochlospermum insignis*, with a vertical underground trunk of a meter or more in length, which contains 75% water at the end of the dry season; and a new sp. of *Acanthococos* (Palmae), not yet named, with an underground stem. The classification of Raunkiaer, with the plant types based on the amt. of protection afforded by the soil, reflects the ecological conditions in Europe and is not adequate for Brazilian ecology.—J. L. Cartledge.

24084. Rivas Goday, Salvador, y Francisco Bellot Rodríguez. *Valdeazores, el interesante valle de Despeñaperros.* [Valdeazores, the interesting valley of Despeñaperros, Spain.] *Bol. R. Soc. Espanola Hist. Nat.* 40(1/2): 57-71. 4 pl. 1942.—The authors explored this valley, in the Sierra Morena, and ascertained the fact that Valdeazores is the correct name for the valley called Valdeflores by Font Quer. Detailed mention is given of the different plants encountered, and tables are given of the spp. belonging to climax and subclimax associations of *Quercetum ilicis monspesulanum*, and several different groups found with *Herbetum. Andryala arenaria* ssp. *mariana*, *Phlomis lychnitis* var. *virens*, and *Erysimum lagascae* (*Hesperis repanda* Lagasca) are descr. Special notes are given on *Thapsia transtagana* forma  $\beta$  *stenocarpa*, *Ferulago granatensis*, *Eusomodendron longirostris*, *Iberis contracta*  $\beta$  *angustifolia*, and *Orchis morio*, all considered noteworthy.

24085. Sharp, A. (U. Tennessee, Knoxville.) *Informe preliminar sobre algunos estudios fitogeográficos efectuados en México y Guatemala.* *Rev. Soc. Mexicana Hist. Nat.* 7(1/4): 35-39. 5 fig. 1946.—This paper emphasizes the remarkable floristic affinities existing between the eastern region of the U. S., and the plateaus of Mexico and Guatemala, notwithstanding their distance. From the study of many characteristic spp., the author discusses the origin of such a flora, commenting on a probable former geological connection of the lands. Several ecological conditions, especially temp. and humidity, common to both countries are also examined. The natural radiation from the rocks and soils, in volcanic regions as those studied in Guatemala and Mexico, is suggested as a probable and important factor in the evolution of plants.—B. F. Osorio Tafall.

24086. Steindórsson, Steindór. *Contributions to the plantgeography and flora of Iceland. IV. The vegetation of Ísafjardardjúp, north-west Iceland.* *Acta Nat. Islandica* 1(3): 1-32. 1946.—In the summer of 1938, Steindórsson travelled over wide areas around Ísafjardardjúp, a firth of the n.-w. peninsula of Iceland, where he examined the flora of different localities. He found the plant formations remarkably uniform. In the upper part of the firth, Langadalsströnd, chamaephyte formations (acc. to the terminology of Möhlholm-Hansen), either heath or copse, are most common, marsh formations and grassland are rare. The mts. are low, mostly devoid of vegetation in their upper parts, due to scree, but in their lower parts there are stretches of marsh and *Grimmia* heath. The outer parts of the firth, the Snaefjallströnd, are much damper, due to heavy snowfalls. The principal formations are fairly dry marshes on the lower parts of the mts. and grassland vegetation covers the slopes and hollows. In depressions, fern thickets occur. The

analyses are made according to the methods of Raunkiär. Among wet-soil formations he found inundation marshes at some few places, moss polls frequently, but marshland most common. The following associations occur: *Eriophorum polystachium-Scirpus caespitosus* ass., *Eriophorum polystachium-Betula nana-Empetrum nigrum* ass., *Carex rigida*-Gramineae ass., and *Carex lyngbyei* ass. The dry soil formations are represented by: 1) heath, 2) copse, 3) snowpatches, 4) gravelly flats and *Grimmia* heath. The heath is composed of the following associations: *Empetrum nigrum-Betula nana* ass., *Empetrum nigrum-Betula nana-Vaccinium uliginosum* ass., *Juncus trifidus-Elyna bellardi* ass., *Juncus trifidus* ass., and *Agrostis tenuis-Anthoxanthum odoratum-Carex rigida* ass. The copse consists of birch (*Betula pubescens* var. *tortuosa*), seldom reaching 1 m. of height, except in the forest of Laugaból, where the trees become 2-4 m. high. The ground vegetation is commonly *Vaccinium uliginosum* and *V. myrtillus*, *Empetrum nigrum*, *Deschampsia flexuosa* and *Carex rigida*. Flowering plants are *Geranium silvaticum*, *Rubus saxatilis*, *Leonodon autumnalis* and *Ranunculus acris*. The snowpatch vegetation consists of *Vaccinium-Empetrum nigrum* ass., *Alchemilla alpina* ass., *Nardus stricta-Anthoxanthum* ass., and *Salix herbacea-Gnaphalium supinum* ass. The sea shore vegetation is mostly grassland.—Doris Löve.

### OCEANOGRAPHY

(See also Entries 24072, 26216, 26218, 26220, 26221, 26222, 26223, 26226, 26261, 26262, 26263, 26264, 26265, 26266, 26267, 26270, 26271, 26274, 26276, 26277, 26278, 26281, 26282, 26283, 26288, 26290, 26298, 26305, 26307, 26308, 26333, 26335, 26337, 26338, 26339, 26340, 26341, 26344, 26351, 26353, 26357, 26467)

24087. Van Overbeek, J., and Raymond E. Crist. (*Inst. Trop. Agric., Mayaguez, Puerto Rico.*) The role of a tropical green alga in beach sand formation. *Amer. Jour. Bot.* 34(6): 299-300. 4 fig. 1947.—*Halimeda opuntia*, of the Codiaceae, grows on rocks and reefs in shallow and protected waters. It gradually fills up its habitat with its debris and is an active principal in the formation of extensive bars, beaches and even islets. Eventually limestone is formed. The sand of some beaches of coral islands consisted for 90% of the calcified remnants of this green alga.—J. van Overbeek.

### LIMNOLOGY

(See also Entries 26190, 26212, 26219, 26272, 26273, 26286, 26328, 26329, 26332, 26343, 26345, 26347, 26349, 26350, 26364, 26365, 26367, 26417, 26418)

24088. Brandt, Andres von. Über den Zelluloseabbau in Seen. [The decomposition of cellulose in lakes.] *Arch. Hydrobiol.* 40(3): 778-821. 21 fig. 1944.—Decomposition of cellulose has been proved so far in the bottom mud of lakes only, yet experience shows that fishing nets in free lake water are corroded by celluloclastic bacteria. Expts. were made in exposing cotton threads at various depths of 3 lakes which differed in many respects. After 3-4 weeks the yarn was tested for resistance against tearing by means of the Schopper apparatus and the results compared with controls. In the eutrophic Graywer Lake and in the oligotrophic Babant Lake in the Masurian region, the corrosion of the cellulose evidently depends on the stratification of the lake. Above the thermocline it is negligible, but it increases greatly in the hypolimnion. During the circulation periods the decomposition of cellulose proceeds strongly in the whole body of water, the celluloclastic bacteria being carried from the bottom mud into all strata of the lake by currents. Light and low temp. hinder corrosion. Thus all factors that facilitate upward movement of bacteria into higher strata and favor their growth and multiplication increase corrosion. In the acid Nitzpöneck Lake no decomposition of cellulose has been observed in the free water except during the estival stagnation. Contrary to conditions in the other lakes, the bottom mud-water-contact zone was not celluloclastic as it communicated its quality to the lake water during the circulation periods, the effect observed was opposite to that in other lakes. The loose consistency of the dy permitted yarn to be placed in the deeper layers of the bottom mud. In 50 cm., decomposition of cellulose was considerable, but decreased again in 70 cm.—Ingo Findenegg.

24089. Brehm, V. Das Disjunktionsproblem und die

Süßwasserfauna. [The problem of discontinuous distribution and the freshwater fauna.] *Arch. Hydrobiol.* 40(2): 589-614. 1943.—In discussing this problem the author lists some spp. recognized recently to be boreo-alpine: *Arcticocampus rheticus*, *A. arclicus*, *A. cuspidatus*, *A. van douwei*, *Moraria duthiei* among the Harpacticida, the Ostracoda spp. *Leucocythere mirabilis*, the Chironomid sp. *Eukiefjeriella cyanea* and the turbellarians *Olomestoma aestivum*, *Dalliyella bardeani* and *Castrada luteola*. In some cases the discontinuous distr. of spp. occurring in n. Europe and in the Alps may be explained more easily by the theory of Scharff, according to which the animals did not reach their present areas starting from the ice-free regions in middle Europe after the diluvial period, as Zschokke has pointed out, but migrated from Asia along 2 paths entering northern Europe and the Alps independently. The organisms entering the Alps are considered to have used the broad land connection existing in the Miocene Age between Asia Minor and the Balkans. *Diaptomus laticeps*, for example, occurs in Scandinavia, the British Isles, the Balkans and the southern Alps, but is missing in the northern Alps. *Heterocope appendiculata* is distr. in the Baltic regions and in Montenegro. These facts cannot be explained by Zschokke's theory.—Ingo Findenegg.

24090. Entz, G., und O. Sebestyén. Die biologische Bedeutung der Driften des Balatonsees. [The biological significance of the drifts in Balaton Lake.] *Arch. Hydrobiol.* 40(3): 753-755. 1944.—In the large, but extremely shallow Balaton Lake in Hungary, great masses of *Phragmites* and other aquatic plants, shells of *Dreissena*, etc., are driven ashore, where they are decomposed. A considerable quantity of organic substance of the lake thus is drawn out of the biological cycle, although part of it reenters the water after being transformed into detritus. Therefore detritus-feeders occur in large number. The humid material of the drifts gives shelter and nourishment to terrestrial cryptozoic animals.—Ingo Findenegg.

24091. Gessner, Fritz. (Pfl. Phys. Inst. Bot. St. Anst. München.) Der Chlorophyllgehalt der Seen als Ausdruck ihrer Produktivität. [The chlorophyll content of lakes as an indicator of their productivity.] *Arch. Hydrobiol.* 40(3): 687-732. 12 fig. 1944.—An attempt is made to measure production of lakes by the amt. of chlorophyll extracted from the phytoplankton.  $\frac{1}{4}$  to 4 l. of the water samples were filtered by "Cella"-filters (pores  $>1 \mu$ ). The filters were exposed for 45 sec. to steam in order to eliminate chlorophyllases and, after drying, were kept in alcohol for 24 hrs. in darkness. The extract was filtered again through a Papier filter, 10 ml. were put in the micro-absorption tubes, and extinction was measured using the filters S66,6, S61, S43 and S45 of the Pulfrich photometer. A pure chlorophyll a soln., served as a standard, chlorophyll b being absent in most planktic algae. In 11 oligotrophic lakes of Bavaria in the summer and autumn of 1941, water samples were taken from various depths; the Starnberger Lake was studied monthly from June-Jan. The total amt. of chlorophyll was found to decrease continuously within that period, probably due to the decreasing amt. of P in the lake water. Comparisons were made with the production of the little Wessling Lake, studied from Oct. to March. This eutrophic lake showed an increase of chlorophyll after the autumnal circulation period. The mean amt. of chlorophyll beneath 1 m.<sup>2</sup> of the surface in the extremely oligotrophic Bib Lake was 4.2%, in the Starnberger Lake 42% of that found in the Wessling Lake. On an average, the last contained only 2-3 times less chlorophyll than an equal area of wooded land. The photosynthetic effect of a certain quantity of chlorophyll in phytoplankton was found to be equal to that of terrestrial plants. Hence it is concluded that the amt. of chlorophyll in lakes at least in summer may be regarded as an indicator of their productivity.—Ingo Findenegg.

24092. Harnisch, Otto. Physiologische Grundlagen von Stenoxymbiose und Euxoxymbiose bei Chironomidenlarven. [The physiological basis of stenoxymbiosis and euxoxymbiosis in Chironomid larvae.] *Arch. Hydrobiol.* 40(1): 184-207. 2 fig. 1943.—Expts. were made to give a physiological explanation of the ecol. differences in Chironomid larvae with regard to the O<sub>2</sub> content of their aquatic habitat. It was seen that the stenoxymbiont larvae of *Eubantyrus inermipes* can stand as small an amt. of O<sub>2</sub> (1-2%) as the euxoxi-



biont larvae of *Chironomus thummi* provided with special respiratory organs. On the contrary, *Procladius praecox*, often associated with *C. thummi* in an  $O_2$ -poor biotope, dies at 5%  $O_2$ -content. The euroxybiosis of the larvae thus does not depend directly on the ability to exploit small amts. of  $O_2$  in the water. Evidence is given by further expts. and histological researches that euroxybiosis in the larvae is accompanied by anaerobic processes. Larvae of *C. thummi* kept in  $O_2$ -free water for about 20 hrs. showed a glycogen consumption about 10 times as great as that in aerobic conditions. After 10-15 hrs. the glycogen consumption was increased anew, hence it is concluded that glycogen is not needed as a source of energy only, but after some hrs. another process is added which, although unknown, is thought to tend to reestablish the normal physiol. state somewhat disorganized by the anaerobic life. This recovery process may be proved also in aerobic conditions by increased  $O_2$ -uptake during 5-6 hrs., if the larvae are brought back from the anaerobic medium into  $O_2$ -saturated water. Thus the uptake of  $O_2$  may be caused by 2 different physiol. requirements, going on also in different ways: If the  $O_2$ -content of the medium exceeds 2%, the normal  $O_2$  consumption of *C. thummi*, called "primary oxybiosis", is independent of the gas tension. The superimposed "secondary oxybiosis", induced by previous anaerobic conditions, is favored by larger amts. of  $O_2$ , the recovery process being shortened by abundance. The mechanism of secondary oxybiosis is elucidated somewhat by the following expt.: Larvae of *C. thummi*, after 15 hrs. of anaerobiosis, were cut into small pieces and the hemolymph removed by rinsing with isotonic NaCl soln. In this case, the  $O_2$  consumption of the surviving tissues was normal. If the pieces were suspended in cell-free hemolymph, the increased  $O_2$  uptake was observed. Thus evidence is given that secondary oxybiosis is induced by an agent present in the hemolymph. In connection with this fact the special respiratory organs (preanal tubuli, hemoglobin) in the larvae of some spp. may be of importance. Although not needed in normal oxybiosis, they will be useful in biotopes poor in  $O_2$ , accelerating recovery after periods of anaerobiotic conditions.—Ingo Findenegg.

24093. Hubault, Etienne. Les grands lacs subalpins de Savoie sont-ils alcalitrophes? [Are the great lakes of Savoy alkalitrophic?] *Arch. Hydrobiol.* 40(1): 240-249. 1943.—The lake of Bourget and 3 smaller lakes were studied concerning the relation between production of phytoplankton and the Ca content of their water. According to Naumann, the Alpine lakes situated in an environment of limestone must be considered to belong to the polytype of alkalitrophy. He pointed out that in water containing  $>100$  mg./l.  $CaO$ , all P and Fe compounds would be precipitated and thus immobilized for production of the plankton. The lake of Bourget conforms to the characteristics of alkalitrophy as given by Naumann, but its  $CaO$  content is much smaller (67-76 mg./l.). Therefore, it is concluded that the inferior limit of polytype must be lowered.—Ingo Findenegg.

24094. Kol, Erzsébet. Vergleich der Kryovegetation der nördlichen und südlichen Hemisphäre. [A comparison between the cryovegetation of the northern and the southern hemisphere.] *Arch. Hydrobiol.* 40(3): 835-846. 11 fig. 1944.—Great differences occur between snow and ice algae of the N. and S. Hemisphere. In the antarctic "red snow" (*Chlamydomonas antarcticus*) is dominant; in the mts. of S. America, *C. sanguinea* occurs. In the N. Hemisphere, *Scotia nivalis* is a representative. Also the associated fungi spp. are vicarious, *Chionaster nivalis* occurring in the N., *Selenotila nivalis* in the S. only. The greenish color of snow in the N. is caused either by *Chlamydomonas* spp. as *C. yellowstonensis*, or by *Raphidomonas*, the latter prevailing especially in Europe. In the Tatra Mts. *Carteria györfyi* also has been observed. *Stichococcus bacillaris* and *Chlorella ellipsoidea* are restricted to the S. Yellow snow is known from the antarctic regions, caused by *Scottila antarctica* and *Sphaerocystis Schroeteri* f. *nivalis* and from the Tatra, colored by *Chlamydomonas flavo-virescens*. On the snow-free ice other spp. occur. In the N. *Ancylonema norden-skiöldii* causes a purple or brownish color. On the contrary, *Mesotaenium berggrenii* has worldwide distribution.—Ingo Findenegg.

24095. Kříženecký, Jaroslav. Untersuchungen zur Frage einer quantitativen Bestimmung des Teichplanktons mittels

Zentrifugieren. [Estimating the plankton in ponds by means of the centrifuge.] *Arch. Hydrobiol.* 40(1): 98-113. 7 fig. 1943.—The author attempted to estimate the amt. of plankton in ponds by comparing the vol. of the centrifuge sediments. The volume after simple sedimentation in tall glass tubes is known to depend far more on the shape and size of the tubes than on the real volume of the planktic organisms. By using the centrifuge, this defect is eliminated, the individuals being flattened so that no spaces occur between them. Nevertheless, no satisfactory results were obtained, the vol. of the sediment being relatively smaller in pond water poor in planktic matter than in water rich in it. This fact must be explained by decreased sinking velocity in concentrated plankton suspensions according to the formula of Stokes, if to the viscosity of the water is added the viscosity of the suspension.—Ingo Findenegg.

24096. Maucha, R. Einige neuere Gesichtspunkte in der Hydrochemie. [Some new aspects of hydrochemistry.] *Arch. Hydrobiol.* 40(2): 305-328. 1 fig. 1943.—The author discusses the rôle of nutritive compounds dissolved in lake water as factors limiting production. As to  $CO_2$ , not only the free gas must be taken in consideration, but also the amt. of carbonate and bicarbonate, an equilibrium being established among these 3 components. In many lakes, inorganic N compounds seem to be present in minimal quantities or not at all, yet the phytoplankton develops very well. Evidently almost the whole amt. of N is present in the organisms and non-living organic substances of the lake. These being decomposed, N is taken up immediately by the subsequent generations of algae. The same applies to the P content of the lake. In some cases the phytoplankton develops in the superficial layers chiefly in spring and autumn, deeper strata being preferred in summer. Minder explained those observations by chemotaxis, the algae descending into deeper layers after having exhausted the N content of the upper horizons, and returning to them when the amt. of nutritive salts is increased again by the partial circulation in autumn; Maucha believes this explanation to be wrong, and the summer descent to be due to excess of light.—Ingo Findenegg.

24097. Minder, Leo. Neuere Untersuchungen über den Sauerstoffgehalt und die Eutrophie des Zürichsees. [Recent studies on the oxygen content and eutrophy in the lake of Zürich.] *Arch. Hydrobiol.* 40(1): 279-304. 1943.—The changing  $O_2$  content of the water of this lake and its role in indicating eutrophy were studied in 1930-41 and compared with previous inquiries. As the lake is a meromictic one, the hibernal circulation not moving the deep layers, the small amt. of  $O_2$  in the hypolimnion does not depend merely on consumption by decomposing planktic matter during stagnation periods in summer, but also on insufficient import of  $O_2$  into deeper layers when circulating. In comparing the  $O_2$  content of the water in 100 m. under the level observed in several yrs., the author concludes that eutrophy increased in 1920-30, but did not increase in the yrs. following. Thus eutrophication is not going on continuously, but by fits and starts, as also may be seen in the sudden changes of the phytoplankton (invasions of *Tabellaria fenestrata* and *Oscillatoria rubescens*, observed yrs. ago). During the estival stagnation the  $O_2$  of the hypolimnion decreases irregularly. The total decrease depends on the quantities of  $O_2$  present in spring. No explanation is given of this observation.—Ingo Findenegg.

24098. Pesta, Otto. Limnologische Untersuchungen an einem Hochgebirgstümpel der Ostmark. [Limnological studies on a small mountain pond in Austria.] *Arch. Hydrobiol.* 40(2): 444-458. 7 fig. 1943.—The Jufenalmtümpel, a pond in 1871 m. elevation, was studied chemically and biologically at 3 periods in 1941. The water is somewhat acid (pH about 6) and showed an  $O_2$  saturation of 70-90%, the temp. rising to  $20^\circ C$  on sunny days. The amt. of N and P is small, in summer increased by cattle pasturing in the environment. The phytoplankton consists of Desmidiaceae, Diatomaceae, *Ulothrix tenerrima* and *Oscillatoria* sp., the Crustacea are represented by *Acanthocyclops vernalis*, *Heteroscope saliens*, *Daphnia l. longispina* f. *littoralis*, *Chydorus sphaericus*, *Alonella excisa* and *A. affinis*. Larvae of *Phalacroceras* were abundant among water-moss.—Ingo Findenegg.

24099. Roll, Hartwig. (Hydrob. Anst. Plön.) Pflanzensoziologie und Seetypenlehre. [Sociology of plants and lake

types.] *Arch. Hydrobiol.* 40(1): 31-47. 1943.—Considering the fact that production in lakes depends on the physical and chem. properties of the water, biological lake types have been distinguished according to the content of important dissolved substances. As chem. analyses are time-consuming, it would be useful to characterize the types by their littoral plant associations. Maristo proposed to pay attention to single predominant spp. of macrophyta. In discussing his results, the author points out that preference should be given to the study of the whole "periphyton," i.e., of the plant societies of the beaches according to the methods of Braun-Blanquet.—Ingo Findenegg.

24100. Ruttner, F. Beobachtungen über die tägliche Vertikalwanderung des Planktons in tropischen Seen. [The diurnal vertical movement of the plankton in tropical lakes.] *Arch. Hydrobiol.* 40(2): 474-492. 3 fig. 1943.—In 1928 the vertical movement was studied in Ranu Lamongan, Ranau Lake and Toba Lake in Java and Sumatra. Since these waters show no stratification within the layers populated by the plankton, analysis of ecological causes of the diurnal migration is facilitated. In general, the diurnal movement goes on as in temperate lakes. According to the behavior of the forms, 3 ecological groups are distinguished: The first, comprising Rotatoria and Nauplii of Copepods, reacts feebly to luminosity. They are not missing in the surface layers at noon and show little movement (*Brachionus angularis* var. *caudatus* and *B. calyciflorus* var. *dorcas*) or none (*Conochilus dossuarius*). *Pedalia intermedia* and *Eudorina elegans* (Volvocales), unlike the others, sink about 5 m. at sunset. The 2d group, consisting of adult Copepoda and Cladocera, shows distinct movements, their maximum occurrence being elevated from 5-10 m. to the surface layer in the evening. Only *Diaphanosoma sarsi* and *D. modigliani* in the Toba Lake did not migrate. *Cypria javana* and the larvae of *Corethra* form a 3d ecol. group, sinking into the O<sub>2</sub>-free metalimnion and hypolimnion during the day (Ranu Lamongan). On the whole, no considerable differences between tropical and temperate lakes were found. The large amplitude of migration observed by Worthington in the Victoria Lake seems to be exceptional for the tropical type just as that in the Vierwaldstätter Lake is among the temperate ones. These exceptions may be due to high transmission of violet and u.-v. rays, great differences having been observed in this respect by recent investigators.—Ingo Findenegg.

24101. Schaeperclaus, W. Der Einfluss verschiedener Faktoren auf die Mengeneinfaltung der Chironomidenlarven am Teichboden. [The influence of various factors on the quantitative development of Chironomid larvae on the bottom of fish ponds.] *Arch. Hydrobiol.* 40(2): 493-524. 12 fig. 1943.—In Speichthausen near Eberswalde (Germany), investigations were undertaken to find the main factors regulating the quantity of bottom animals in ponds. The most important and constant nourishment of fish are the larvae of Chironomids, especially of *Polypedium*, *Ceratopogon*, *Chironomus plumosus* and *Calopteta gregaria*. The mean total wt. of the bottom fauna was 7.38 g. per sq. meter of the ground. In most cases 30% of it were Chironomids. As the quantity of animals depends not only on factors favoring propagation and growth, but also on those that diminish the number of individuals, expts. were made to show the influence of one of them, the feeding of fish. Some ponds were densely populated with carp, others had but a few, and one pond had none; yet the amt. of *Chironomus* larvae was practically the same in all the ponds. Probably the consumption by fish was compensated by the surplus of eggs and young larvae that do not develop in ponds with a small carp population. Hence it is concluded that the bottom fauna quantitatively depends chiefly on conditions favoring the development of animals, the diminishing factors being of less importance.—Ingo Findenegg.

24102. Steusloff, Ulrich. Ein Beitrag zur Kenntnis der Verbreitung und der Lebensräume von Gammarus-Arten in Nordwest-Deutschland. [Distribution and biotopes of Gammarus spp. in n.-w. Germany.] *Arch. Hydrobiol.* 40(1): 79-97. 6 fig. 1943.—Distribution and biotopes of 4 spp. of *Gammarus* were studied. *G. pulex pulex* is not properly rheophil; it occurs in lowland beaches and streams only. In more rapid water it lives only in sheltered localities. It may be found in rivers with very small lime content, being

able to tolerate pH 5.6. *G. pulex fossarum* occurs in more elevated regions, often in association with *Bythinella dunkeri* and avoiding all stretches altered by culture. *G. p. pulex* and *G. p. fossarum* were found to be far less sensitive to lack of carbonate than Wunder suggested. In general they do not occur together. *G. roeselii* lives in similar habitats as *G. p. pulex*, being still more restricted to the lowlands. *G. berilloni* was found in small numbers in quite different habitats, its occurrence probably being limited by the quality of food.—Ingo Findenegg.

24103. Strom, Kaare Muenster. Die Farbe der Gewässer und die Lundqvist-Skala. [The color of the waters and the Lundqvist scale.] *Arch. Hydrobiol.* 40(1): 26-30. 1943.—In estimating the biol. qualities of lakes by the color of the water, the Forel-Ule scale is not much used. According to Lundqvist's suggestion, a simple "word-scale" is proposed, comprising 11 degrees such as "deep-blue, blue, greenish blue" up to "dark brown."—Ingo Findenegg.

#### WILDLIFE MANAGEMENT—AQUATIC

(See also Entries 24101, 24141, 24234, 24338, 25256, 25537, 25555, 26242, 26352, 26469, 26472, 26473, 26474)

24104. Allee, W. C., Peter Frank, and Marjorie Berman. (U. Chicago.) Homotypic and heterotypic conditioning in relation to survival and growth of certain fishes. *Physiol. Zool.* 19(3): 243-258. 1946.—Young *Ameiurus melas* show better survival in an artificial pond water made in once-distilled water when this medium has been conditioned by having *Carassius* or other *Ameiurus* live in it than they do in unconditioned (control) water. The homotypically conditioned medium allows slightly longer survival for *Ameiurus* than does the heterotypically conditioned one tested. Similarly, young *C. auratus* survive longer in these conditioned media than in the uncontaminated controls, except that with goldfish the 2 types of water were equally effective in promoting survival. Although introduced Cu and Al ions, in cones. comparable with those found in once-distilled water, produced no deaths, Cu contamination of the water is suspected of being the toxic agent, the activity of which is greatly decreased or nullified by conditioning. Al in some form may also be related to the observed toxicity. Very low cones. of both metallic ions were present in the once-distilled water. An otherwise similar artificial pond water, based on water redistilled in a tin-lined still, was not toxic, and positive growth was given by assay fish, even in the control medium. As in earlier expts., goldfish grew in length more rapidly in the conditioned water than in uncontaminated, but otherwise similar, control media. They maintained wt. slightly better in bullhead- than in goldfish-conditioned water. Extracts from the surfaces of bullheads and of goldfishes have essentially similar protective and growth-promoting powers when used in equal cones. Water with the same conditioning coefficients contained less amino N following bullhead, as contrasted with goldfish-conditioning. Differences in oxidizable organic matter in the 2 types of conditioned media are smaller and less consistent than are the variations produced by changing the diet of the conditioning fish. With the cones. used in these expts., all observed effects of conditioned water were, on the average, either neutral or favorable in their effects on fish survival, wt. maintenance, or growth. There is a brief discussion of causal factors.—Auth. summ.

24105. Alvarez, J. El cultivo de peces en estanques artificiales. *Rev. Soc. Mexicana Hist. Nat.* 7(1/4): 75-85. 1946.—Information on fish culture in artificial ponds with addition of chemical fertilizers, and the excellent results reported in foreign countries. The author insists about the utility of employing this practice in Mexican inland waters in order to increase the food supply for the population.—B. F. Osorio Tafall.

24106. Baerends, G. P. A survey of the Dutch fishery for demersal seafish in the years 1939-1945. *Ann. Biol. [Copenhagen]* 2: 60-67. 1947.—A description of the activity of the Dutch fleet from home ports during the war, with tables of the quantities landed and of the number of vessels engaged, is given. A considerable decrease in the fishing intensity took place after May, 1940. Figures of the landings in 1945, from the liberation in May onwards, are given. The quantities landed per day's absence, com-

pared with similar data of the yrs. 1933 and 1934, indicate an increase in the density of the stock of >2.7 times as a benefit of the war respite. From the steady increase of the landings of cod from a limited coastal area it is concluded that the cod stock near the Dutch coast increased markedly during the war. In contrast to what was found after 1918, no haddock was caught in the neighborhood of the Dutch coast. The stock of plaice seems to have increased to >5 times its pre-war density; the stock of dabs did not increase to such an extent, it is even doubtful whether it increased at all. The sole stock probably increased in the same magnitude as the plaice. A new aspect, as far as memory goes, was the appearance of shoals of horse-mackerel which spawned in the Waddensea. In 1945 the mean size of the fish caught was markedly greater than in the pre-war yrs.—G. P. Baerends.

24107. Benisch, Jon. (Reichsanstalt für Fischerei, Berlin-Friedrichshagen.) Künstlich hervorgerufener Aphanomycosis Befall bei Wollhandkrabben. [Artificial infection of *Eriocheir sinensis* by *Aphanomyces astaci*.] Zeitschr. Fisch. u. Hilfsw. 38: 71-80. 1940.—Towards the end of the last century the European crayfish (*Astacus astacus*) was almost annihilated by *Aphanomyces astaci*. The American crayfish (*Cambarus affinis*) which was imported later on and is widespread now, proved to be immune. Nothing was known in this respect about *Eriocheir sinensis* (Woolly-hand-crab, brought to Europe by shipping), which has spread rapidly esp. over northern Germany, and is doing much damage to fisheries. Since *Cambarus* is not susceptible for *Aphanomyces*, the question arose, whether the spread of *Eriocheir* could not be restricted by infecting it with this disease. Experimental: Heavily infected specimens of the European crayfish were kept in a tank, the overflowing water of which ran into a 2d one, which contained *Eriocheir*. The expts. not only showed that *Eriocheir* may thus be infected, but that once infected, specimens may transmit the disease directly. In the European crayfish, *Aphanomyces* attacks all parts of the shell where the chitin is comparatively soft, and the nervous system; while in *Eriocheir* only the skin of the joints of the extremities is infected and eventually destroyed. In *Eriocheir* the disease proceeds slower than in the European crayfish and only heavily infected animals die. Death occurs usually because the animals are unable to cast off their shells, in lighter cases they leave parts of their extremities in the old shell (autotomy).—W. G. Einsele.

24108. Bramsnaes, Frode, M. Jul, and C. V. Otterstrøm. Barriers against fish by means of electricity or veils of air. Rept. Danish Biol. Sta. 47: 39-46. 3 fig. 1942 (1945).—Expts. were conducted in an exptl. canal, rectangular in cross-section, 180 cm. wide and 180 cm. deep. The depth of the water was 90 cm., and circulating pumps maintained a velocity of 5-6 cm./sec. Parallel to one side of the canal a plate of insulating material (Etronit) was placed at a distance of 15 cm. from the wall of the canal so that the fish swimming between the plate and the wall were protected against the influence of the electric field. The aim of the expts. was to put up a barrier obliquely in the remaining part of the canal, thus directing the fish through the protected passage. To make the barrier, 2 brass bars were used as electrodes. One electrode was placed on the bottom of the canal and the other was immediately above and parallel to it, 2-5 cm. below the surface. The voltage difference between the electrodes ranged from 15 to 35-40 volts. Best results were obtained when there was a difference of 25-30 volts. For the expts. the following fish were used: Rainbow trout, pike, carp, and eel. The trout and pike would swim boldly into the field and become stunned, eventually finding the passage. The carp could not be driven into the field. By taking his time, the eel found the passage without having to turn around. For the investigations, of course, all fish were ascending the canal. An effective electrical barrier against descending fish would no doubt be impossible. Some expts. with barriers consisting of a veil of air proved unsuccessful, especially in running water. The Station hopes to carry out a similar expt. with electrical barriers in nature.—H. H. Howell.

24109. Brynjelsen, Ola. Norges fiskerier 1943. [Norwegian fishing industry.] Norges Offisielle Statist. 10(125): 1-179. 1947.—This is a statistical report of the Norwegian fishing industry for 1943. It contains, among other things, a table giving the scientific, English, French, German and

Norwegian names of sea fish; data on boats and fishermen from 1920 to 1943; detailed operations on fishing conditions in different districts; reports of district inspectors dealing primarily with shortages of fuel, motors and gear; and numerous other statistical information.—L. A. Sandholzer.

24110. Chapman, Wilbert McLeod. (California Acad. Sci., San Francisco.) Observations on tuna-like fishes in the tropical Pacific. California Fish and Game 32(4): 165-170. 1946.—An account is given of observations on tuna-like fishes obtained in the tropical Pacific in the course of setting up subsistence fisheries at various island bases during the war. Yellowfin tuna, skipjack and wahoo were found to be abundant at Midway, Palmyra and Johnson Islands. Skipjack were abundant at Canton I., through the Solomons and into the Bismarks. Yellowfin were not observed in any of the locations worked south of the equator. Wahoo were not obtained s. of the equator except at Green Island, n. of Bougainville. What was probably the dogtooth tuna (*Gymnosarda nuda*) was taken in the Solomons and at Green I. and was reported, but not taken, in New Caledonia. Spanish Mackerel (*Scomberomorus* sp.) were found in commercial quantities around the reefs in New Caledonia and the Solomons. Bait fish were in uniformly poor quantity around the atolls and smaller islands and were found in only modest abundance around the larger land masses.—W. M. Chapman.

24111. Ciegiewicz, W., and K. Posadzki. (Fish. Lab., Gdynia, Poland.) Comparative studies of the spring and autumn spawning herring of the Bay of Danzig. Ann. Biol. [Copenhagen] 2: 159-165. 1947.—On the basis of examination of 20 samples of herring, containing 4,872 individuals, collected from May, 1936, to Apr., 1937, and 6 samples, containing 3,008 individuals from the autumn of 1945 and spring of 1946 it is stated that the spawning season of the autumn-spawning race of herring in the Gulf of Danzig takes place during Sept. and Oct., attaining its maximum in the latter part of Oct., while that of the spring spawning race takes place between Apr. and June. The catch of autumn spawning shoals consists of fishes 16-26 cm. long and bearing 2-7 summer zones on their scales. The catch of spring spawning shoals consists of fishes 14-26 cm. long, bearing 2-8 summer zones on their scales. The back-calculated lengths  $l_1, l_2, l_3, \dots$  of autumn spawners are higher than that of spring spawners. The greatest difference is to be observed between  $l_1$  and  $l_2$ , due to the fact that the first winter ring of autumn spawners is formed during the 2d winter of their life. The growth of spring spawners is better than that of the autumn spawners. The arithmetical mean number of vertebrae— $M$ —of autumn spawning herrings varies from 55.24 to 55.58 (average 55.41), while that of spring spawning herrings varies from 55.19 to 55.57 (av. 55.38). The catches of autumn-spawning herrings made in 1945 contained longer and older fishes than those in 1936.—W. Ciegiewicz.

24112. Daniel, R. J. (Liverpool U., England.) The growth-rate of Whitebait Herring of the North Wales Coast. Cons. Perm. Internat. Explor. Mer. Jour. Cons. 15(1): 42-60. 2 fig. 1947.—Young herrings (*Clupea harengus*) in their 1st yr. are caught along with sprats, in weirs made of wicker-work and set between the tide marks on the coast of North Wales. Although these herrings may form a heterogeneous population it was possible to segregate the broods for 1939 and 1940 by the use of modal values derived from length-frequency curves. The growth curve derived from these modes (and also median values) shows rapid growth from 55.7 mm. length on June 1st to 89 mm. on Sept. 1st a slower rate from 89 mm. to 99.7 mm. by Dec. 1st, and practically a cessation of growth Dec. to Mar. This rate of growth between June and Dec. in the Irish Sea is much slower than that of 1st-yr. herring in the English Channel (Plymouth 58 mm. to 126 mm.) or in the Clyde (83 mm. to 133 mm.). It is probable that the N. Wales fish are the result of late spawnings locally in Nov.-Dec. In the annual herring fishing between North Wales and the Isle of Man during Aug. and Sept., the length frequencies of 1st-yr. growth, as represented by the laying down of the first scale ring ( $l_1$ , value) show 2 strong modal points, one at 100 mm. and the other at 130 mm. The former agrees with the 1st-yr. growth in late spawned fish discussed in this paper but the



latter is not represented in the length measurements.—R. J. Daniel.

24113. Pannevig, Alf. The Flodevig Sea Fish Hatchery, Arendal, Norway. *Cons. Perm. Internat. Explor. Mer. Jour. Cons.* 15(1): 7-12. 6 fig. 1947.—Gives in few words the history and activities of the Hatchery. The spp. dealt with at the Hatchery are cod, lobster and oysters (*Ostrea edulis*).—Alf Dannevig.

24114. Eichler, H. (U. Königsberg.) Über die Beziehungen zwischen Wachstum, Form und Geschlecht beim Karpfen. [The relations between growth, shape and sex in the carp.] *Zeitschr. Fisch. u. Hilfsw.* 38: 81-88. 1940.—As in many other cases the ♂♂ of the carp gain maturity earlier than the ♀♀ (3d and 4th summer, respectively). At the end of the 2d summer no differences in shape or wt. of the 2 sexes could be detected. At the end of the 3d summer, the av. wt. of the ♂♂ was about 7% less than that of the ♀♀. This difference is ascribed to the earlier maturation of the ♂♂. It is noteworthy, however, that the extent of the 2 distribution curves shows no marked difference; the ♂♂ are less frequent only in the heavier groups. Though the ♂♂ often are more slender than the ♀♀, a general difference in shape of the 2 sexes could not be established. The sex ratio was 1:1.—W. G. Einsele.

24115. Fridriksson, Árni. Hin mikla brynstirtugengd sumarid 1941. [The abundance of Horse Mackerel in the summer of 1941.] *Náttúrufræðingurinn* 11: 146-154. 1941.—The horse mackerel, *Caranx trachurus*, is rare on the coasts of Iceland. It is reported to have been found in some of the years 1835-40 on the n.-w. coast and in 1937 at Hafnarfjörður (s.-w. coast). In 1941 it was observed at Nordurfjörður and Hornafjörður, eastern Iceland, Vestmanna Islands on the s. coast, Patreksfjörður on the w. coast, and Skagafjörður on the n. coast. The fishes caught varied between 12 and 16 cm. in length (mean length 13.67 cm.).—Doris Löve.

24116. Fridriksson, Árni. Túnfiskur. [*Orcynus thymus*.] *Náttúrufræðingurinn* 14: 144-148. 1944.—*O. thymus* is seldom seen at the coasts of Iceland. However, it was reported in 1767, 1880, 1898, 1913, 1928, 1929, 1931, 1932, 1933 and 1943. In 1944 it was seen rather often at the south coast, where some fishes about 300 kg. in wt. and 270 cm. long were caught, Aug. 20. The fishermen reported that there had been hundreds of them in the sea, but after a heavy storm on Sept. 2, no more were observed. It is supposed that they have come with the Gulf Stream, which has been extremely warm since 1926. Over 50% of the fishes observed have been reported from the s. coast, 20-15% from the s.-w. and n.-w. coasts, and only about 5% from the n. and e. coasts.—Doris Löve.

24117. Fridriksson, Árni. Makrillinn við Ísland. [The mackerel in Iceland.] *Náttúrufræðingurinn* 14: 138-142. 1944.—The mackerel (*Scomber scombrus*) was a rare guest at the coasts of Iceland before 1926. It was caught in 1904 at Sandarkrokur and Hrutafjörður, northern Iceland, in 1905 at Seydisfjörður, eastern Iceland and in 1908 at Grindarfjörður, western Iceland. Since 1926 it has not been rare, but is caught in nets and, especially in 1944, was abundant on the n. coast. It comes to the coasts in the warm (8-9°C) Gulf Stream.—Doris Löve.

24118. Gudmundsson, Björn. Nokkur ord um selveidi á Íslandi fyrrum og nú. [Seal fishing on Iceland, now and in olden times.] *Náttúrufræðingurinn* 14: 149-169. 1944.—A popularly, but interestingly, written essay on the history of seal hunting at the coasts of Iceland from the Viking Age to modern times.—Doris Löve.

24119. Hass, G. Eine durch Bakterien hervorgerufene Schwimmblasenentzündung bei Regenbogenforellen. [Inflammation of the swimming bladder of the rainbow trout by bacteria.] *Zeitschr. Fisch. u. Hilfsw.* 38: 111-112. 1940.—In recent yrs. a new trout disease appeared simultaneously in several fish-raising plants that raise trout and carp. The exterior of the trout does not show any signs of illness except that the belly protrudes, due to an enlargement of the swimming bladder, which is filled with a stinking purulent fluid. The disease is probably caused by *Pseudomonas punctata schäpe*, the bacterium that causes belly-dropsy of the carp.—V. G. Einsele.

24120. Herman, Elmer F. Notes on tagging walleyes in the Wolf River. *Wisconsin Conserv. Bull.* 12(4): 7-9.

1 fig. 1947.—A preliminary report on a 3-yr. investigation dealing with age, growth and migration of the walleyes of Lake Winnebago and tributary waters as conducted by biologists of the Wisconsin Conservation Dept. The observations indicate that migration begins shortly after the ice leaves the Wolf River and while the water temp. ranges from 38° to 44°F. In 1946, the actual spawning began when the water temp. reached 58°F. 3,694 walleyes were tagged over the 3-yr. investigation and to date 343 (9.28%) have been returned. A metal strap tag 1½ in. long and ⅜ in. wide was used. This was attached to the upper lip near the hinge of the jaw and locked by hand. Tag returns show that the majority of the walleyes return to Lake Winnebago immediately following spawning. Some traveled a distance of 50 to 60 miles downstream in a 10-day period. A summarization of age classes, as detd. from scale samples, is included along with average wts. of both sexes. The age-wt. ratio was based on a total of 787 specimens.—J. McCutch.

24121. Hodgson, W. C. The East Anglian herring fishery in 1945. *Ann. Biol. [Copenhagen]* 2: 79-80. 2 fig. 1947.—The great increase in the herring stock of the southern North Sea is shown, but it is considered that the 6 yrs.' rest which the fish have enjoyed during the war has not produced any change in the growth-rate or in the length/weight ratio. The maximum age of the herrings is similar to that observed in pre-war shoals, suggesting that these herrings have a span of life of about 12 yrs.—W. C. Hodgson.

24122. Khan, H. Development of fisheries in the Punjab. II. Culture and propagation. *Indian Farming* 7(8): 331-335. 10 fig. 1946.—Brown trout and Rainbow trout have been introduced into snow-fed Himalayan streams in Kulu and Kangra. Rainbow trout have not given satisfactory results and their culture has been abandoned. Hatchery rearing of brown trout and stocking of streams are discussed.—K. L. Anderson.

24123. Koch, H. J. (U. Louvain.) Dinoflagellaten als oorzaak van verlammeende mosselvergiftiging. [Dinoflagellates as the cause of paralysis by mussel intoxication.] *Natuurwetenschap. Tijdschr.* 22: 196-200. 1940.—Intoxication after eating mussels from the Belgian Brugge-Zeebrugge canal is produced by a toxic substance which accumulates in the molluscs after they have ingested large amts. of *Pyrodinium phoneus*. The dinoflagellates were isolated by means of their phototropism, and from them was extracted a toxic thermostable substance, producing the same toxicity and symptoms as the toxic mussels. The toxicity of the mussels runs parallel with the number of dinoflagellates in the fishing places. Both their periodic changes run parallel.—L. Vandendriessche.

24124. Kostomarov, Boris, und Sergěj Hrabě. Der Kannibalismus bei der Karpfenbrut (Cyprinus carpio L.). [Cannibalism among the spawn of carp.] *Arch. Hydrobiol.* 40(1): 265-278. 9 fig. 1943.—In a carp pond near Chlumec, Bohemia, too densely populated by spawn, the heavier young carps, not more than 18 days old, began to feed upon their fellow fish somewhat stunted by the scarcity of food. Within 2 weeks all feeble specimens of the spawn were eliminated by the cannibals, which were growing apace in this period. Later on they reverted to normal feeding habits.—Ingo Findenegg.

24125. Larsen, Knud. The liberation of salmon and trout fry in Denmark. *Rept. Danish Biol. Sta.* 47: 17-24. 3 fig. 1942 (1945).—Salmon and trout fry have been liberated in Danish water-courses starting in 1858, but no fixed principles in the liberations existed until recent years. Gradually the impression arose that "the more fry released the better" was an objectionable principle; therefore, in 1927 the Danish Biol. Station made its original investigation for the purpose of making a rational plan of liberation. Lack of personnel hindered the work until 1934. From then on the Station aimed at the widest possible distribution of fry, "pre-eminently to the areas of the streams that, on account of dammings, are barred to the sea trout naturally ascending; the density of the stock liberated is conditioned upon the character of the streams, which are classified according to the dimensions and conditions of bottom, vegetation, nourishment, etc., and due regard is paid to barrings (turbines, irrigations, pollutions)." To the year 1942, 38 such plans of liberation were worked up, including a quantity of 2,336,500 fry. The author describes the plan of liberation

being followed; it consists of 5 sections and allows for the keeping of careful data. Fry are transported in milk pails, and at the place of liberation they are transferred to watering pots with a small catcher. The sieve should be removed from each pot, and in releasing the fry the spout should be placed beneath the water and the fry poured in the direction of the current. Boy Scouts and fishermen's associations were collaborating in the stocking.—H. H. Howell.

24126. Nowak, W. Biometrische Studien über die Karpfen aus den Teichwirtschaften Borsdorf und Gratzten und ein kurzer Rückblick auf die praktische Bedeutung dieser Untersuchungen. [Biometrical studies on the carp of the Borsdorf and Gratzten hatcheries, with a brief discussion of the practical meaning of such investigations.] *Zeitschr. Fisch. u. Hilfsw.* 38: 91-109. 1940.—This paper contains a description of the carp-races of 2 large carp hatcheries and some advice, based upon a series of measurements of different length and height dimensions, how to select fishes for propagation.—W. G. Einsele.

24127. Pedersen, Torbjørn, and Johan T. Rudd. (U. Oslo.) A bibliography of whales and whaling. *Norske Vidensk.-Akad. Oslo Hvalrådets Skrift.-Sci. Results Marine Biol. Res.* 30: 1-32. 1946.—The bibliography consists of 308 items divided into 2 parts: (1) papers in technology and chemistry concerning the raw material and products of whaling, and (2) papers concerning the biology of whales and the conditions for whaling. A brief historical account of modern whaling is included, dating from 1870 when the harpoon gun was invented.—C. M. Weiss.

24128. Rae, B. B. (Marine Lab., Aberdeen, Scotland.) Review of the Scottish Lemon Sole Fishery at Faroe with special reference to the years 1933 to 1938. *Cons. Perm. Internat. Explor. Mer. Jour. Cons.* 15(1): 61-68. 1 fig. 1947.—This paper is based on Scottish fishery statistical returns. Factors influencing the incidence of trawling round the Faroe Islands are discussed. For the greater part of the year trawling is profitable only during the hours of darkness, but from June to Aug. it becomes possible to fish successfully throughout the 24 hrs. Cod (*Gadus morrhua*) and haddock (*G. aeglefinus*) provide the bulk of the fish caught in this region. The Lemon Sole (*Microstomus kitt*), although a long way behind from the point of view of wt. of fish landed, nevertheless is a close third economically, as a result of the high price which it fetches in the Scottish market. The heaviest landings of lemon soles from Faroe are made during the months June to Aug., thus coinciding with the period of greatest trawling activity.—B. B. Rae.

24129. Rasmussen, Birger. Notes on the deep sea prawn in a Norwegian Fjord. *Ann. Biol. [Copenhagen]* 2: 10-13. 4 fig. 1947.—The rate of growth and sexual development of the prawn *Pandalus borealis* are apparently influenced by environment. In the Vigra fjord the majority of the 1½-yr.-old prawns function as ♂♂ but some specimens mature as ♀♀. The growth of the ♂♂ is strongly retarded during breeding season. At the end of Dec. the group of ♂♂ splits into 2 sections, the one, consisting of larger specimens, changing into ♀♀, the other, consisting of smaller animals, retaining the character of ♂♂. The ♂ part of the age group grow slowly; the ♀ section has an accelerated growth. When 2½ yrs. old, about ½ of the age group are large oviparous ♀♀, and the remainder of the same age group consists of smaller individuals functioning as ♂♂ for the 2d time. After this, these latter also change their sex. When 3½ yrs. old, all prawns of the age group are ♀♀. Through commercial catches the prawn population is most heavily taxed when about 2 yrs. old. At this age a single year class may constitute about 90% of the catch. The numerical strength of the year class decreases rapidly after that age. When 3 yrs. old they constitute only about 10% of the catch and are no longer of particular significance for the commercial fishery.—Birger Rasmussen.

24130. Rudd, Johan T. (U. Oslo.) Further studies on the structure of the baleen plates and their application to age determination. *Norske Vidensk.-Akad. Oslo Hvalrådets Skrift.-Sci. Results Marine Biol. Res.* 29: 1-69. 28 fig. 1945.—Further studies on the structure of the baleen plates show that the horny tubes in the medullary layer do not parallel each other. Instead, a convergence from the gum toward the tip is conspicuous, particularly in the plates of suckling calves. By measurement of the convergence in

the baleen plate and graphic representation, the growth of the horny tube from the gum line can be determined. The growth periods of the baleen plates are compared to ages detd. from length records and from the condition of the ovaries or testes. However, age records taken from baleen records alone cannot be applied with safety to animals above an age of 3 or 4 yrs. Majority of northern fin whales mature at 3 yrs., sei whales at 2½ yrs. Growth rates of northern fin and sei whales are found to be lower than those for the southern representatives of these species.—C. M. Weiss.

24131. Sandholzer, Leslie A., and C. R. Buckner. (U. S. Fish and Wildlife Serv., Washington, D. C.) Bacteriological studies of oyster conditioning. *Commercial Fish. Rev.* 9(1): 7-11. 1947.—When kept in tanks of seawater, oysters did not improve in sanitary quality as determined by the coliform index, even when the water was chlorinated. At Cl concs. sufficiently high to kill coliform bacteria, the oysters failed to pump water. At lower concs., failure to eliminate the coliforms was due to recontamination because of the inability to get rid of these bacteria in the water in the tank. When oysters were maintained in flowing, clean water which was free of Cl and coliform bacteria, the total bacterial count was reduced rapidly, and the coliform bacteria were completely eliminated within a very short time. In some instances, oysters treated in this manner were coliform-free within 30 mins. From these expts. it appears that a system employing flowing water will probably be the most satisfactory for conditioning oysters.—L. A. Sandholzer.

24132. Schlottke, Egon. (U. Danzig, Germany.) Untersuchungen über die Verdauungsfermente der Quappe, des Flussbarsches, der Regenbogenforelle, und die Verdauungsfermente im Karpfendarm und ihre Änderungen. [Investigations on the digestive enzymes of the burbot (*Lota vulgaris*), the perch (*Perca fluviatilis*), the rainbow trout (*Trutta iridea*), and the digestive enzymes in the gut of the carp (*Cyprinus carpio*) and their changes.] *Zeitschr. Fisch. u. Hilfsw.* 37: 381-394. 1939; 38: 1-69, 323-344. 1940.—Tests previously descr. (*Zeitschr. vergleich. Physiol.* 24: 1937) were applied to the digestive tracts to determine the presence or absence of the following enzymes: pepsin, proteinase (trypsin), aminopolypeptidase, carboxypolypeptidase, dipeptidase, lipase, amylase and occasionally maltase. When the fishes (all the spp. investigated) had not been fed for a long time, proteinase was very scarce or lacking. After feeding it appears in large quantities in the contents of the gut and the appendices pyloricae. In the epithelia invariably very little was found. During hunger periods almost no pepsin could be detected. With feeding, secretion sets in, the maximal amts. being present some 12 hrs. after feeding; then it declines parallel with the emptying of the stomach. The peptidases are chiefly found in the epithelia of the appendices pyloricae and the gut. Unlike pepsin and proteinase, there are no significant quantitative differences in hunger-fishes and at different stages of digestion. The 2 predaceous fishes, *Perca* and *Lota*, produce practically no lipases of their own. Considerable amts. are found in the contents of the gut after feeding when the food animals contained lipases which are not attacked by the digestive juices of the fish. Insect larvae are rich in resistant lipases. The lipases of earthworms and still more those of copepods are quickly destroyed in the digestive tract of the perch. Rainbow trout has a lipase formation of its own; the appendices pyloricae contain lipase in large quantities. In the epithelia of the small gut and the rectum it is present in lesser quantities, and lacking in the stomach. The pH of the stomach fluid of the rainbow-trout is 3.1. All food enzymes seem to be destroyed there. In the carp, lipases are found in varying quantities; apparently the carp can produce moderate quantities of lipases of its own. These seem to be almost totally retained in the epithelia. Considerable amts. that may be found in the lumen of the gut are always taken in the food. As in the case of the perch, especially, lipases of insect larvae were well preserved and are quite active in the nutritive pulp. Amylase could be detected in larger quantities only in the lumen of the gut of the carp. Like proteinase, it is secreted in connection with the digestive process. Rainbow trout and perch evidently produce almost no amylase. The nutritive pulp of the perch contained some amylase when its food was rich on it. To decide between the 2 existing views as to the function



of the appendices pyloricae, whether they are chiefly organs of secretion of enzymes, or of digestion and absorption, was one of the main concerns of the present papers. All observations confirmed the latter view, which means that the appendices are parts of the small-gut system with the same histological structure and physiol. function. Numerous expts. were made with carp and rainbow-trout to determine whether amts. of enzyme produced and speed of digestion (i.e., temp. of environment), correspond to each other. In rainbow trout, no significant differences in amt. of enzymes (with the exception of amino-polypeptidase) could be detected in specimens that had either lived at low or high temps. Fishes that lived in cold water always showed more than those from warm water. It is well known that the greediness of carps depends very much on the temp. of the water. It was not proved that intensity of appetite (temp.) and amts. of enzyme produced no parallel, but it was found that the rate of production of proteinase corresponds to the amts. of food taken in. At 9.5° remains of earth worms are still found in the stomach of perch 64 hrs. after feeding, larvae of *Culex* 48 hrs. after, and remains of copepods 30 hrs. after. It takes about twice as long for the whole digestive tract to become completely empty. *Lota* would not eat horse meat. At 14° it took 3 days for earthworms to leave the stomach completely, and 1 day later nutritive pulp was not present in the gut. In rainbow trout at 10° gastric digestion of horse meat was completed in 90 hrs. and after 3 days more, no food remained in the small intestine; at 17-18° the digestion of horse meat took only a little less time, the digestion of larvae of *Lucilia* (meat-fly) only about 1/2 as long. In carp at 12°, complete digestion of earthworms required about 3 days, at 18° > 1/2 as long. Artificial food (mixture of blood-fish and meat-flower) was digested about equally as quickly.—*W. Einsle.*

24133. Tåning, A. Vedel. (*Marine Biol. Lab., Copenhagen, Denmark.*) Observations on young plaice in the Danish Waddensea during the war. *Ann. Biol. [Copenhagen]* 2: 53-54. 1947.—These studies in the youngest age-groups of plaice (*Pleuronectes platessa*) were carried out in the North Sea Waddensea off southern Jutland during the war period. An accumulation of the 1- to 3-yr.-old plaice has occurred during the period in these coastal waters and, simultaneously with this increase in density, a conspicuous decrease in average size has taken place.—*A. V. Tåning.*

24134. •Valle, K. J. (*Turku U.*) Untersuchungen über das Wachstum der Fische in einigen Karelschen Seen. *Ann. Zool. Soc. Zool.-Bot. Fennicae Vanamo* 11(1): 1-65. 1944.—Length measurements of fishes in 18 Karelian lakes (earlier belonging to Finland, now to U.S.S.R.) have been made, and the values obtained are compared with the nature and fishing conditions of these lakes. Of fish measurements so far carried out in Scandinavia the mean values have been calculated for the following fish spp.: *Perca fluviatilis*, *Lucioperca sandra*, *Acerina cernua*, *Leuciscus rutilus*, *L. erythrophthalmus*, *L. idus*, *Abramis björkna*, *A. brama*, *Alburnus lucidus*, *Coregonus albula*, *Esox lucius*. On the basis of these values, three growth classes for each species have been differentiated, viz., those with poor, medium, and good growth. The growth relations are compared with the production types of the lakes and with the quantity and quality of the fish fauna. Some practical suggestions as to the attendance of fishing waters are put forth.—*E. Halme.*

24135. Van de Velde, A. J. J. (*U. Ghent, Belgium.*) [Chemical constitution of *Cardium edule*.] *Natuurwetenschap. Tijdschr.* 24: 202-210. 1942.—1 kg. Brutto weight of the examined mollusc gives 36.7 gm. of edible dry matter, composed of 25.5 gm. of carbohydrates, 1.4 g. of lipids, and 1.8 gm. sugars, with a total caloric value of 124 calories.—*L. Vandendriessche.*

24136. Vilela, H. Notas sobre a biologia da amêijoa (*Tapes decussatus* L.). I. Crescimento. II. Variação sazonal das gônadas. [Notes on the biology of *T. decussatus*. I. Growth. II. Seasonal variation of the gonads.] *Trav. Stat. Biol. Marit. Lisbonne* 47. 17p. 5 fig.; 48. 8p. 1 pl. 1941.—This sp. is of great economic interest in Portugal, and the study of its growth, made in small exptl. vivaria, has given results immediately applicable to the maintenance of the clam in parks and industrial deposits. The 2d note reports an anatomical and histological study of the gonads, and sexual maturation during the course of one

yr. was followed. Full maturity occurred in June-July, egg laying began in Aug.-Sept., no gametes were left in Dec. Within the size limits of the specimens studied, the sp. is bisexual; the no. of ♂♂ and ♀♀ appears to be equal, and the sexual development of the ♂♂ is more precocious.—*F. Navarro* (courtesy *Bol. R. Soc. Española Hist. Nat.*) (transl.)

24137. Went, Arthur E. J. (*Dept. Agric., Fish. Br., Dublin, Ireland.*) Irish salmon, 1945. *Sci. Proc. Roy. Dublin Soc.* 24(19): 165-178. 1947.—Scales of 8,300 salmon from 25 Irish rivers were examined microscopically for age data. Two-yr. smolts were most important in all rivers and 1-yr.-olds were more important than 3-yr.-olds in all rivers except 3.—*P. H. Yancey.*

24138. Went, Arthur E. J. (*Dept. Agric., Fish. Br., Dublin, Ireland.*) Salmon of the Kerry Blackwater. *Sci. Proc. Roy. Dublin Soc.* 24(20): 179-187. 3 fig. 1947.—The Blackwater River in County Kerry, Ireland, long famous for its salmon, is compared with the Ballisodare and found to vary more in yield. The reason for this is not known but it is shown that 90% of the fish of the Blackwater are derived from the brood resulting for a single spawning season. Hence if the spawning season was bad a poor yield would probably result, whereas in the Ballisodare and other rivers there is a tendency for the catch to spread over 2 or more brood yrs.—*P. H. Yancey.*

24139. Wimpenny, R. S. The Rye Bay plaice stock in the war of 1939-45. *Ann. Biol. [Copenhagen]* 2: 68-74. 5 fig. 1947.—A total of 3,487 plaice taken by inshore motor trawlers working within 10 miles of the shore in Rye Bay were examined as small monthly samples for age, gutted wt. and length. From Oct., 1942, to Oct., 1945, 45,308 fish of the same population were measured each quarter in samples of between 3 and 4 thousand. The results showed an increase in the proportion of older fish to 1944, a strong and important year-group born in 1939, and strong yr.-groups born in 1942 and 1943. The largest fish appeared on the grounds each winter. Although fishing increased up to 1944 so did the catch per hr. and presumably the stock. In spite of this there was a tendency for wt. to increase relatively to length from 1942 to 1944. The Hastings landings showed that plaice increased in abundance relatively more than the other demersal fish landed from the area.—*R. S. Wimpenny.*

#### WILDLIFE MANAGEMENT—TERRESTRIAL

(See also Entries 23940, 24009, 24059, 24079, 25255, 25482, 25531, 26492, 26494, 26495, 26498, 26502, 26503, 26505, 26523, 26524, 26531, 26532, 26533, 26534, 26537, 26541, 26543, 26544, 26559)

24140. Cottam, W. P. (*U. Utah, Salt Lake City.*) Resource problems of Utah. *Proc. Utah Acad. Sci. Arts and Lett.* 22: 53-64. 1945.—A committee of the Utah Acad. Sci., Arts and Lett. believes that the following points should be considered in connection with current legislation. During the last century Utah grazing lands have decreased more than 50% in forage value. Utah rural communities reached saturation in population in 1920, and many subsequently decreased. There has been loss of topsoil from mountain watersheds, and disastrous floods in populated valleys. The grass on the foothills is being replaced by pigmy forest. Sand dunes are increasing. Desirable game animals are becoming extinct and deer and rodents are increasing too rapidly.—*D. H. Galway.*

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